



Non-Lethal Defense "VI" Symposium

“Non-Lethal Weapon Options in the Global Fight Against Terrorism”

Reston, VA

14-16 March 2005

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- Mr. Larry Bickford, US Army Aberdeen Proving Ground

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Non-Lethal Defense VI

Non-Lethal Weapon Options in the Global Fight Against Terrorism

REVISED AGENDA

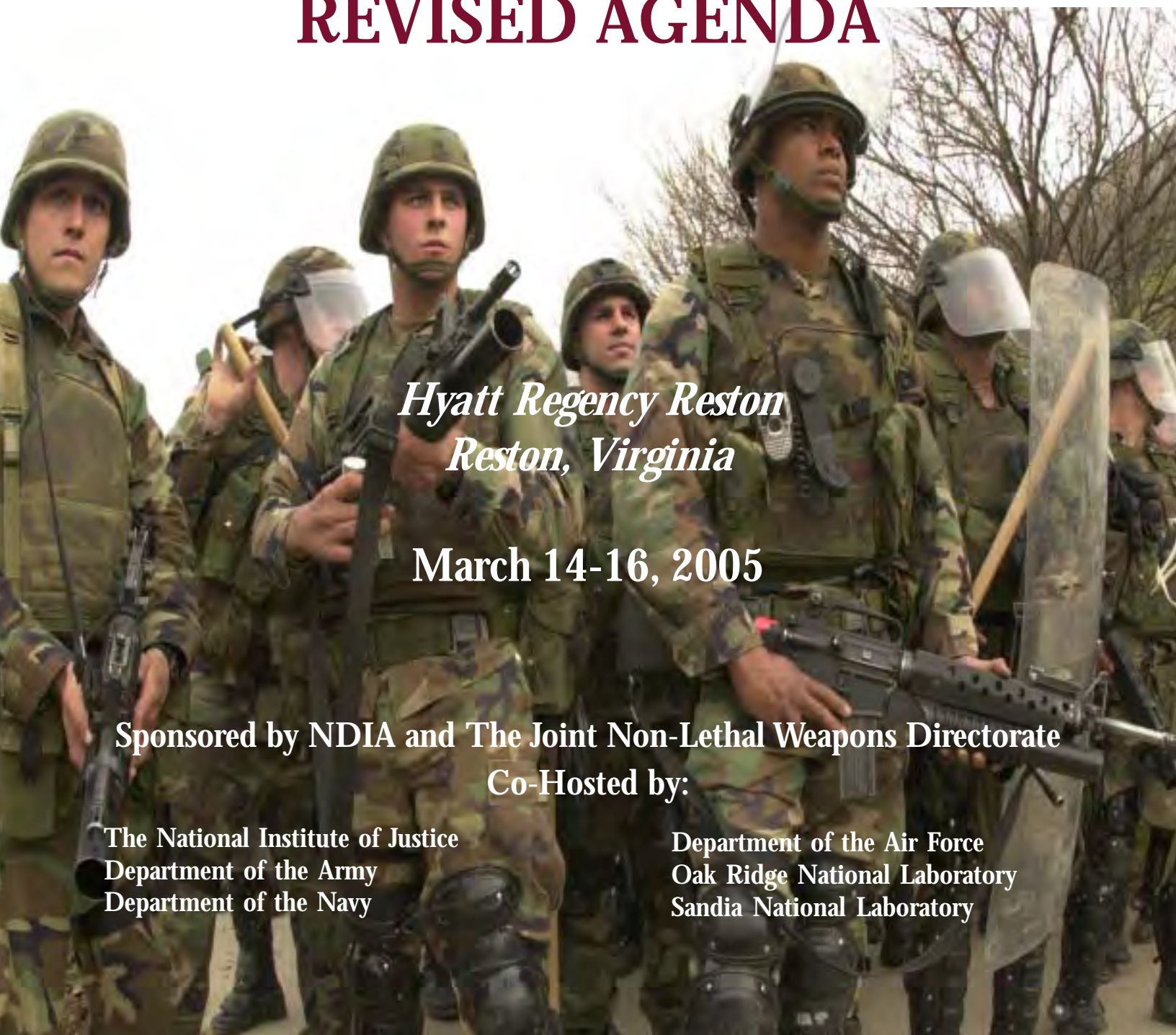
*Hyatt Regency Reston
Reston, Virginia*

March 14-16, 2005

Sponsored by NDIA and The Joint Non-Lethal Weapons Directorate
Co-Hosted by:

The National Institute of Justice
Department of the Army
Department of the Navy

Department of the Air Force
Oak Ridge National Laboratory
Sandia National Laboratory



National Defense Industrial Association (NDIA) Non-Lethal Defense “VI” SYMPOSIUM FRAMEWORK

Theme: Non-Lethal Weapon Options in the Global Fight Against Terrorism

Monday, March 14, 2005

- 7:00 a.m. Continental Breakfast and Registration
- 8:00 a.m. **Welcome**
Colonel John Alexander, USA (Ret)
- 8:30 a.m. **Speaker:** Master Sergeant (P) Jonathan Godwin, USA
- 9:15 a.m. Break
- 9:30 a.m. **JNLWP Overview**
Colonel Dave Karcher, JNLWD
- 10:00 a.m. **Current and Desired Capabilities Forum**
Major General Lott, USMC, Deputy MCCDC
Brigadier General Coker, USA, TRADOC
Rear Admiral Kunkle, USCG, Non-Lethal IPT Member
Captain Bruns, USN, USSOCOM
Moderator: Colonel Koster, USA, Project Manager for Close Combat Systems
- 12:15 p.m. Informal Luncheon
- 1:45 p.m. **Keynote Speaker:**
Lieutenant General Jan Huly, USMC, Deputy Commandant for Plans, Policies and Operations
- 2:30 p.m. Break
- 2:45 p.m. **“From the Front,” Current Operations Forum**
Colonel GI Wilson, USMC
Master Sergeant (P) Jonathan Godwin, USA
- 5:30 p.m. Reception in Display Room
- 6:00 p.m. - **Dinner**
8:00 p.m. **Speaker:** Mr. Terry Pudas, Director, Office of Force Transformation

Tuesday, March 15, 2005

- 7:00 a.m. Continental Breakfast
- 8:00 a.m. **Keynote Speaker:** Ms. Sue Payton, Deputy DDR&E
- 9:00 a.m. Break
- 9:15 a.m. **Non-Lethal Acceptability Challenges: Standards, Human Effects, Testing, and Training Forum**
Lieutenant Colonel Mark Wrobel, USAF, JNLWD
Dr. Mary Williams, JNLWD
Lieutenant Colonel Jonathan Drummond, USAF, AFRL
Dr. John Kenny, Penn State University
Mr. Larry Bickford, US Army Aberdeen Proving Ground
Moderator: Ms. Susan Levine, JNLWD
- 11:00 a.m. Break
- 11:15 a.m. **Speaker:** Commander Charles “Sid” Heal, Los Angeles County Sheriff’s Office
- 12:00 p.m. Luncheon
- 1:30 p.m. **Speaker:** Lieutenant Colonel Ron Madrid, USMC (Ret), Marine Corps Research University, Penn State
- 2:15 p.m. **Non-Lethal Academic Initiatives Forum - Panel Discussion**
Mr. David Koplow, Georgetown University Law School
Lieutenant Colonel Ed Hughes, USA (Ret), Penn State University
Dr. Glen Schwery, University of New Hampshire
- 3:30 p.m. Break
- 3:45 p.m. **The View From Overseas Forum Various Topics - Panel Discussion**
Dr. Martin Hubbard, United Kingdom
Mr. Pascal Paulissen, Netherlands
Dr. Marten Risling, Sweden
Mr. Frederico Aguiar, Brazil
- 5:00 p.m. Adjourn

Wednesday, March 16, 2005

- 7:00 a.m. Continental Breakfast
- 8:00 a.m. **Homeland Security/Homeland Defense Forum**
Mr. John Blair, M2 Technologies
Mr. Joe Cecconi, DOJ
Lieutenant Colonel Jim Duncan, USMC, Office of the Judge Advocate General Code 10, International and Operational Law Division
- 9:45 a.m. Break
- 10:00 a.m. **Speaker:** Mr. Thomas Kuster, Deputy Assistant Secretary of Defense for Homeland Defense
- 11:00 a.m. **Closing Remarks**
Colonel John Alexander, USA (Ret)
- 11:15 a.m. Adjourn

Non-Lethal Defense VI

Non-Lethal Weapon Options in the Global Fight Against Terrorism

*Hyatt Regency Reston
Reston, Virginia*

March 14-16, 2005

Event #5420

Sponsored by NDIA and The Joint Non-Lethal Weapons Directorate
Co-Hosted by:

The National Institute of Justice
Department of the Army
Department of the Navy

Department of the Air Force
Oak Ridge National Laboratory
Sandia National Laboratory



National Defense Industrial Association (NDIA) Non-Lethal Defense “VI” SYMPOSIUM FRAMEWORK

Theme: Non-Lethal Weapon Options in the Global Fight Against Terrorism

Monday, March 14, 2005

- 7:00 a.m. Continental Breakfast and Registration
- 8:00 a.m. **Welcome**
Colonel John Alexander, USA (Ret)
- 8:20 a.m. **Speaker:** Sergeant Major Jonathan Godwin, USA
- 9:00 a.m. Break
- 9:15 a.m. **JNLWP Overview**
Colonel Dave Karcher, JNLWD
- 10:00 a.m. **Current and Desired Capabilities Forum**
Major General Lott, USMC, Deputy MCCDC
Brigadier General Coker, USA, TRADOC
Rear Admiral Kunkle, USCG, Non-Lethal IPT Member
Colonel Koster, USA, US Army Non-Lethal Weapon Acquisition Manager
- 12:00 p.m. **Displays Manned**
- 12:15 p.m. Informal Luncheon
- 1:45 p.m. **Keynote Speaker:**
Lieutenant General Jan Huly, USMC, Deputy Commandant for Plans, Policies and Operations
- 2:30 p.m. Break
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Sergeant Major Godwin, USA
INIWIC Instructor
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Lieutenant Colonel Mark Wrobel, USAF, JNLWD
Captain Joe Rockemann, USMC, INIWIC
Lieutenant Colonel Jonathan Drummond, USAF, AFRL
Dr. John Kenny, Penn State University
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Ms. Susan Levine
Mr. Blasé Levin, KSU
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- 8:00 a.m. **Non-Lethal Academic Initiatives Forum**
Presentations/Panel Discussion; Moderator –
Mr. David Koplow, Georgetown Law School
Mr. Ed Hughes, Penn State University
Dr. Glenn Shwaery, University of New Hampshire
- 9:30 a.m. Break
- 9:45 a.m. **Homeland Security/Homeland Defense Forum**
Mr. John Blair, M2 Technologies
Mr. Joe Cecconi, DOJ
- 11:30 a.m. Closing Remarks
- 11:45 a.m. Adjourn

Non-Lethal Defense VI Symposium

Call for Displays

Display

Increase your company's or organization's exposure at the premier Non-Lethal Defense VI Symposium by participating in this displaying opportunity. **Displaying (\$1,000)** will provide you the opportunity to exhibit your company products in a designated display ballroom of the Hyatt Regency where receptions, breakfast and coffee breaks will take place. Displays must conform to the guidelines set forth below. Additionally, your company's name will be included in the on-site brochure. For more information, please contact **Simone Baldwin at (703) 247-2596 or via e-mail at sbaldwin@ndia.org**.

Display Selection Ground Rules

1. All written applications must be received by **2 PM, Monday, March 7, 2005**.
2. If more than ten applications are received, a lottery will be conducted to determine the ten (10) sponsors for this year's Non-Lethal VI Symposium.
3. Sponsors will be notified by e-mail no later than **March 8, 2005**.
4. Those applicants who were not drawn will be notified and will be kept on a waiting list should a winning sponsor withdraw.
5. No one company will be allowed more than one sponsorship, except in the case where less than ten (10) companies respond by **2 PM, Monday, March 7, 2005**.

Display Guidelines

All displays must be of the simple table-top/pop-up style standards. Space per display shall be 8' X 2 1/2'. Minimal hardware is to be utilized (computer systems for demonstration purposes are OK). No formal decorating company is involved. Companies should bring their own pop-up display panels and plan to do their own set-up. Standard 2.5 X 8ft. draped folding table and two chairs will be provided with each display space. **Standard power outlet is available upon request.** No other props or set-ups (pipe & drape, plants, etc.) are being utilized. **Displays are to be set up by 12:00pm on Monday, March 14, 2005 and should remain in place until after the morning break on Wednesday, March 16, 2005. The cost for the opportunity to display is, \$1,000.00.**

Displays will be available to attendees during the Monday evening reception, all breakfast and noon meals, and during all coffee breaks.

Hotel Information

A block of rooms has been reserved at **The Hyatt Regency Reston**, 1800 Presidents Street., Reston, VA 20190. Call 703-709-1234 to make reservations. The room rates are \$189 single for industry attendees and prevailing government per diem rate for government attendees. The per diem rate is available ONLY to active duty military or civilian government employees. Identification will be required at check-in; a retired military ID is NOT acceptable. Reservations must be made on or before **Friday, February 25, 2005**. Rooms may be sold out before **Friday, February 25, 2005**. After that date, reservations will be accepted on a space available basis. Attendees are responsible for making their own hotel reservations. **Be sure to mention that you are with the Non-Lethal Defense VI Group in order to receive the group rate.**

Non-Lethal Defense VI Symposium
"Non-Lethal Weapon Options in the Global Fight Against Terrorism"
Event # 5420 Registration for Displays

Name _____
Title _____
Company Name _____
Division/Dept. _____
Address _____
City/State/Zip _____
Phone _____ Fax _____ E-mail _____

Display/Exhibits Requirements:

All displays must be of the simple table-top/pop-up style standards. Space per display shall not exceed 8 ft. wide by 2.5 ft. deep. Minimal hardware to be utilized (computer systems for demonstrations are OK). No formal decorating company is involved. Companies must bring their own displays and plan to do their own set-up. Standard 2.5 x 8 ft. draped folding tables and chair will be provided for each display space. No other props or setups (pipe & drape, plants, etc.) will be utilized.

Display Hours:

Displays are to be set-up by 12:00 PM on **Monday, March 14, 2005** and should remain in place until after the morning break on **Wednesday, March 16, 2005**. Displays must be removed by 4:00 PM on **Wednesday, March 16, 2005**.

Cost: Displays includes one complimentary registration and electrical hook-up: \$1,000.00

Display Rules & Regulations

1. If NDIA should be prevented from holding the conference for any reason beyond NDIA's control (such as, but not limited to, damage to the building, riots, strikes, acts of government, or acts of God) or if a displayer cannot occupy the assigned display space due to reasons beyond NDIA's control, then NDIA has the right to cancel the conference or any part thereof, with no further liability to the displayer other than a refund of display space fee, less a proportionate share of the conference cost incurred.
2. Neither the management of the host facility nor NDIA shall be liable for the damages, loss or destruction to the displays by reason of fire, theft, accident or other destructive causes. Displayer shall lease space at his sole risk. Neither the management of the host facility, NDIA nor any of their agents, servants or employees will be accountable or liable for accidents to displayers, their agents or employees.
3. The displayer shall be liable to the host facility and/or NDIA for any damage to the building and/or the furniture and fixtures contained therein which shall occur through acts or omissions of the displayer.
4. Displayer assumes the entire responsibility and hereby agrees to protect, indemnify, defend and hold harmless NDIA, the host facility, their officers, employees, and agents against all claims, losses and damages to persons and property, governmental charges or fines, and attorney's fees arising out of or caused by displayers installation, removal, maintenance, occupancy or use of the display premises or any part thereof, including any outside display areas.
5. Displayer acknowledges that NDIA does not maintain and is not responsible for obtaining insurance covering displayer's property. Displayers are advised to obtain business interruption and property damage and loss insurance to cover such occurrences.

Send this form with payment for display to:

Simone L. Baldwin, National Defense Industrial Association, 2111 Wilson Boulevard, Suite 400
Arlington, VA 22201-3061, Phone: (703) 247-2596, Fax: (703) 522-1885, E-mail: sbaldwin@ndia.org
Deadline for sign-up is March 7, 2005, (make checks payable to NDIA - Event # 5420)

- ☐ Check (payable to NDIA - Event # 5420)
☐ Visa ☐ Diner's Club ☐ Mastercard ☐ Amex

Credit Card # _____ **Exp. Date** _____

Authorized Signature _____

Conference Registration:

Payment must be made at the time of registration. Please complete the attached form and mail your fee, payable to: **The National Defense Industrial Association (NDIA), Event #5420, 2111 Wilson Boulevard, Suite 400, Arlington, VA 22201-3061**. Faxed registrations are also acceptable. Please include your credit card number (Diners Club, Visa, MasterCard, American Express), name, card expiration date, and signature on the registration form and fax to **NDIA at (703) 522-4656**. Registration may not be done over the phone or via email.

The registration fees for The Technical Information Division Symposium are as follows:

Regular Registration Fees:

Industry NDIA Member	\$650
Industry Non-Member**	\$700
Gov't/Allied Gov't/Academia	\$500

** The Non-Member fees include a one-year individual membership to NDIA.

The conference fee includes attendance at all sessions, coffee breaks, Friday's lunch, and administrative costs. The **Government/Allied Gov/Academia Fees** apply **Only** to Active Military and Civil Service personnel with government identification cards and employees of academic institutions.

Register for this conference at <http://register.ndia.org/interview/register.ndia?~brochure~5420>. You will receive an e-mailed confirmation after you use the **CONFIRM** button on the web page. You can also put yourself on a mailing list for future brochures at the same site. When registering on-line, please review your information and then **"submit"** and **"confirm"** your entry. On-line registration will end at close of business, eastern standard time, on **Wednesday, March 9, 2005**. Please register on-site after that date.

CANCELLATION POLICY AND REFUNDS

Registrants who cannot attend the conference must provide written notification of cancellation to Simone Baldwin, sbaldwin@ndia.org. A \$150 cancellation fee will be applied to cancellations received on/before March 2, 2005. Beginning March 3, 2005, no refunds will be given for any cancellations. Refunds of any kind will be processed AFTER the conclusion of the conference. Substitutions are welcomed and must be submitted in writing via email to Simone Baldwin, sbaldwin@ndia.org by 5pm EST on Wednesday, March 9, 2005. Badges are non-transferable. This refund policy applies to all attendees regardless of their method of registration or reason for cancellation.

FORMS OF PAYMENT

NDIA accepts Diners Club, MasterCard, Visa, American Express, Traveler's Checks, Cash, and Government Purchase Orders (DD1556 only). NDIA does not accept purchase orders from non-government entities, and they will not be invoiced for payment. Your credit card will be billed when received. **NDIA does not issue refunds for the sole purpose of switching forms of payment; please be sure you are registering with the correct form of payment. A fee may be applied to those wishing to switch forms of payment.**

FOREIGN PAYMENT

Registration fees may be paid by credit card, U.S. Government Purchase Orders/1556, Check, or Electronic Transfer, checks must be drawn on U.S. banks in U.S. (\$) dollars. NDIA does not accept purchase orders from foreign governments and will not invoice them for payment. If paying by electronic transfer, the total amount received by NDIA must be calculated as follows: (\$Registration Fee + any incurred Bank, wiring, and/or Conversion fees). Please include the name of the attendee and event# in the bank transfer information.

ATTENDANCE ROSTER

An attendance roster will be distributed at the conference. Your registration form and payment must be received by: March 9, 2005 to be included in the roster. An updated roster will NOT be printed after the conference.

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ATTIRE

Appropriate dress for the conference is business or equivalent military duty uniform.

NATIONAL DEFENSE MAGAZINE

Advertise in National Defense and increase your company's exposure at this conference! National Defense will be distributed to the attendees of this conference and all of NDIA's other conferences. For more information, contact Dino Pignotti at phone (703) 247-2541; fax (703) 522-4602, email dpignotti@ndia.org.

WWW.DEFENSEJOBS.COM

The Defense Industry's leading employment website; find a job, post a job listing, post a resume, and search resumes. For more information please contact info@defensejobs.com or (703) 247-9461. Please visit www.defensejobs.com

INQUIRIES

For questions regarding attendee participation at this conference, contact Simone L. Baldwin at (703) 247-2596 or via e-mail, sbaldwin@ndia.org.

NDIA supports the American's with Disabilities Act of 1990:

Attendees with special needs (to include special dietary needs) should call (703) 522-1820 prior to **March 9, 2005**

Non-Lethal Defense VI
Hyatt Regency Hotel • Reston, VA
March 14 - 16, 2005 • Event #5420

National Defense Industrial Association
2111 Wilson Boulevard, Suite 400
Arlington, VA 22201-3061
(703) 522-1820 • (703) 522-4656 fax
www.ndia.org



- 3** Ways to sign up:
1. Online with a credit card at www.ndia.org
 2. By fax with a credit card — Fax: 703-522-4656
 3. By mail with a check or credit card

☐ **Address change needed**

NDIA Master ID/Membership # _____ Social Security # _____
(if known—hint: on mailing label above your name) (last 4 digits – optional)

Prefix _____
(e.g. RADM, COL, Mr., Ms., Dr., etc.)

Name First _____ MI _____ Last _____

Military Affiliation _____ Nickname _____
(e.g. USMC, USA (Ret.) etc.) (for Meeting Badges)

Title _____

Organization _____

Street Address _____

Address (Suite, PO Box, Mail Stop, Building, etc.) _____

City _____ State _____ Zip _____ Country _____

Phone _____ ext. _____ Fax _____

E-Mail _____

Signature* _____ Date _____

Preferred way to receive information

Conference information ☐ address above ☐ Alternate (print address below) ☐ E-mail

Subscriptions ☐ address above ☐ Alternate (print address below)

Alternate Street Address _____

Alternate Address (Suite, PO Box, Mail Stop, Building, etc.) _____

City _____ State _____ Zip _____ Country _____

* By your signature above you consent to receive communications sent by or on behalf of NDIA, its Chapters, Divisions and affiliates (NTSA, AFEI, PSA, NCWG, WID) via regular mail, e-mail, telephone, or fax. NDIA, its Chapters, Divisions and affiliates do not sell data to vendors or other companies.

By completing the following, you help us understand who is attending our meetings.

Primary Occupational

Classification. Check ONE.

- ☐ A. Defense Business/Industry
☐ B. R&D/Laboratories
☐ C. Army
☐ D. Navy
☐ E. Air Force
☐ F. Marine Corps
☐ G. Coast Guard
☐ H. DOD/MOD Civilian
☐ I. Gov't Civilian (Non-DOD/MOD)
☐ J. Trade/Professional Assn.
☐ K. Educator/Academia
☐ L. Professional Services
☐ M. Non-Defense Business
☐ N. Other _____

Current Job/Title/Position.

Check ONE.

- ☐ A. Senior Executive
☐ B. Executive
☐ C. Manager
☐ D. Engineer/Scientist
☐ E. Professor/Instructor/Librarian
☐ F. Ambassador/Attaché
☐ G. Legislator/Legislative Aide
☐ H. General/Admiral
☐ I. Colonel/Navy Captain
☐ J. Lieutenant Colonel/Commander/Major/Lieutenant Commander
☐ K. Captain/Lieutenant/Ensign
☐ L. Enlisted Military
☐ O. Other _____

Year of birth _____
(Optional)

Registration Fees

Regular Registration Fees:

Industry NDIA Member ☐ \$650
and affiliates (AFEI, NCWG, NTSA, PSA, WID)

Industry non-NDIA Member² ☐ \$700

Government/Academia¹ ☐ \$500

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¹Includes a free three-year NDIA membership and *National Defense* magazine for Military and Government employees (first time members only).

☐ No do not sign me up for the free government membership.

²Registration fees for non-NDIA (or affiliate) members include a one-year non-refundable NDIA membership—\$15.00 will be applied for your 12 month subscription to *National Defense* magazine.

Payment Options

- ☐ Check (payable to NDIA)
☐ Cash
☐ Government PO/Training Form # _____
☐ VISA
☐ MasterCard
☐ American Express
☐ Diners Club

If paying by credit card, you may return by fax to (703) 522-4656.

Credit Card Number

□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

Exp. Date □ □ / □ □

Signature _____

Date _____

Questions?

Contact: Ms. Simone L. Baldwin, Meeting Planner
(703) 247-2596 email: sbaldwin@ndia.org

Mail to:

NDIA, Event #5420
2111 Wilson Boulevard, Suite 400
Arlington, VA 22201

Fax to:

(703) 522-4656



2111 Wilson Blvd., Suite 400
Arlington, VA 22201
<http://www.ndia.org>



Non-Lethal Defense VI
Event #5420
March 14-16, 2005
Hyatt Regency Reston
Reston, Virginia

NON-LETHAL WEAPONS: NO ROAD TO HELL

**John B. Alexander, Ph.D.
Senior Fellow
Joint Special Operations University**

NON-LETHAL DEFENSE VI

Reston, Virginia

14 March 2005

**FUTURE WAR:
NLW in 21st Century Warfare
St. Martin's Press, 1999**

**WINNING THE WAR
St. Martin's Press
July 2003**

Contact: Email: Nonlethal2@aol.com, (702) 804-5575

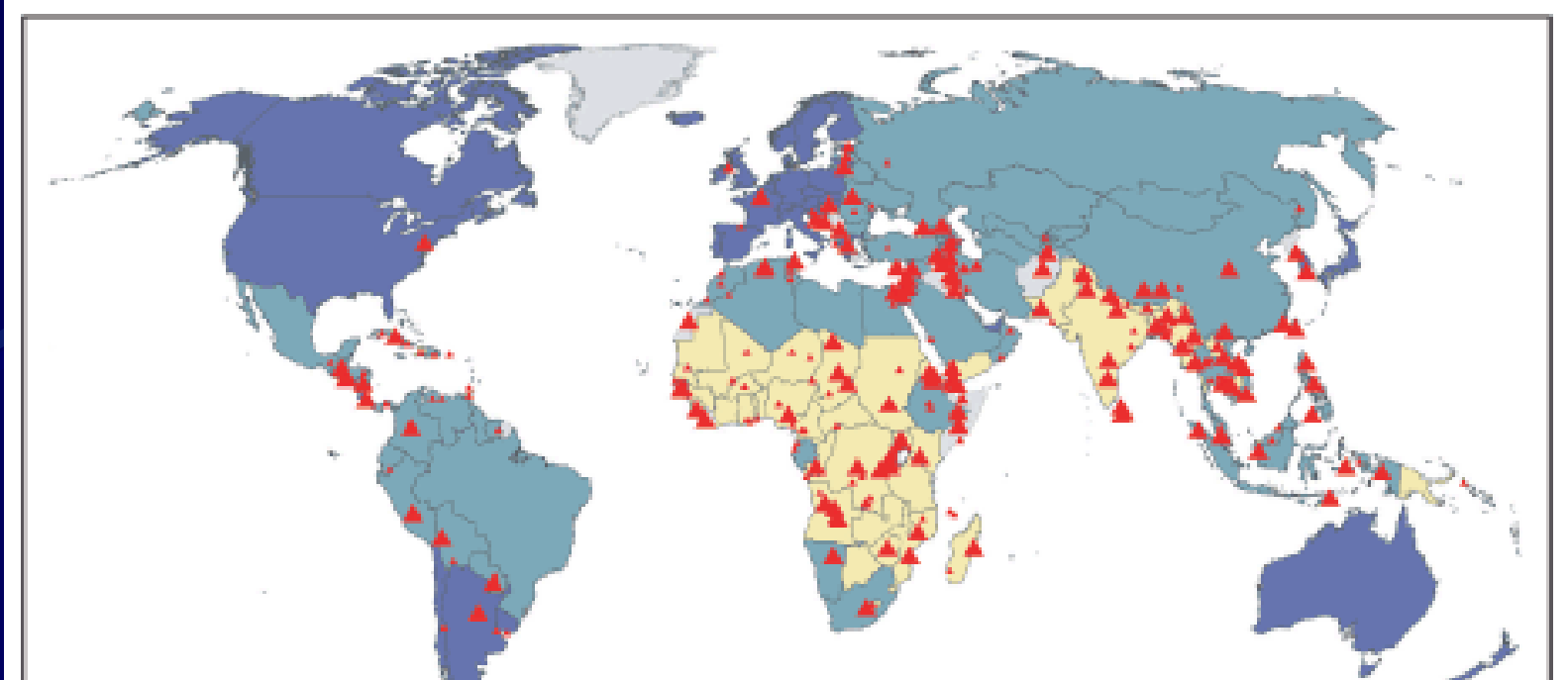
SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

- **NLWs make it easier to initiate war**
- **NLWs will start a new arms race**
- **NLWs may be used as instruments of torture**
- **NLWs will result in some deaths and serious injuries**
- **NLWs used as a precursor and easier to kill opponents**
- **NLWs will be used to suppress lawful dissent**
- **NLWs do not have sufficient data to support their use**

SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

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A DECADE OF CONFLICT



AFGHANISTAN



SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

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WHAT NEW ARMS RACE???

WORLD NLW \$50M/Yr



Non-Lethal Weapons are 0.012% of US DOD Budget

SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

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NLWS AND TORTURE



Monk with torture devices used by Chinese



Victoria with instruments of torture

TORTURE IS AN ISSUE OF HUMAN INTENT- NOT DEVICES



NEW SCIENTIST

NewScientist.com

"The World's No. 1 Science & Technology News Service"

<http://www.newscientist.com/article.ns?id=dn7077>

Maximum pain is aim of new US weapon

19:00 02 March 2005

Exclusive from New Scientist Print Edition

David Hambling



E. P. Industries, Inc. / Mission Research Corp.

"It could be used for torture..." John Wood, University College London

"I am deeply concerned about the ethical aspects..." Andrew Rice

"Pain researchers are furious...." David Hambling

SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

- NLWs make it easier to initiate war
- NLWs will start a new arms race
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NLW DEATHS AND INJURIES



Compared to what????

More than 110 deaths of children under 6

17 deaths with 125,000 rounds fired
Probability of fatality 0.00014



THE ISSUE IS TRAINING AND SUPERVISION

COMPARED TO WHAT?

Foam Baton

Bean-Bag Round



10mm Black Talon

TASER AS TARGET



CATCH 22

- **94 DEATHS FROM TASER??**
- **ONLY 6 AUTOPSIES FIND TASER A CONTRIBUTING FACTOR**
- **NO INDEPENDENT RESEARCH - WHAT ABOUT THE AUTOPSIES**
- **HOW MANY IN-CUSTODY DEATHS WITHOUT TASER?**
- **WHAT IS THE TIMING OF NEWS ARTICLES?**
- **INDUSTRIAL ESPIONAGE/SABOTAGE**
- **NO NEWS STORY EVER DIES – EVEN WHEN DISPROVED**

IS THERE AN AGENDA???

**Amnesty International
Calls For Taser Suspension**

**EPIDEMIC
ERGOFUSION**



**REMEMBER
DEEP THROAT**

SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

- **NLWs make it easier to initiate war**
- **NLWs will start a new arms race**
- **NLWs may be used as instruments of torture**
- **NLWs will result in some deaths and serious injuries**
- ***NLWs used as a precursor and easier to kill opponents***
- **NLWs will be used to suppress lawful dissent**
- **NLWs do not have sufficient data to support their use**

NAILING A FOOT TO THE FLOOR

MOSCOW THEATER



A MATTER OF CHOICE

INCAPACITATING AGENTS

WHAT YOU DID READ:

- NERVE GAS KILLED RUSSIAN HOSTAGES (UPI)
- DEADLY END TO MOSCOW SIEGE SHOWS DANGERS OF INCAPACITATING CHEMICALS (AP)
- CONCERN ARISES OVER TYPE OF GAS USED BY MOSCOW (WASH POST)
- USE OF GAS RISKS OTHERS FOLLOWING SUIT (SF CHRONICLE)



WHAT YOU SHOULD HAVE READ:

HUNDREDS SAVED BY USE OF INCAPACITATING AGENT

**WOULD YOU SET TODAY'S SPEED LIMITS BASED ON
AUTOMOBILE TECHNOLOGY OF 1900???**

SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

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SUPPRESSING DISSENT



Nepal



Watts, CA



Madrid



Brazil

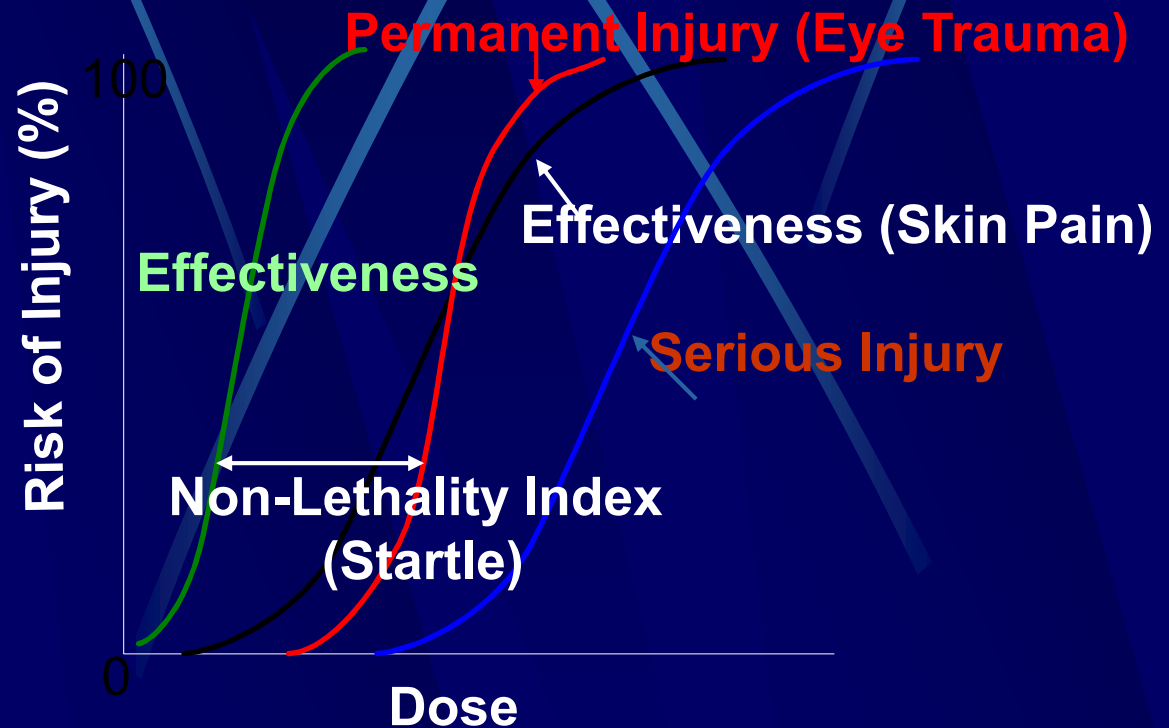


Mexico City

SEVEN DEADLY SINS OF NON-LETHAL WEAPONS

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- **NLWs will be used to suppress lawful dissent**
- ***NLWs do not have sufficient data to support their use***

HOW GOOD IS GOOD ENOUGH?



BUT WHAT ABOUT PEOPLE WHO:

- **HAVE PACEMAKERS?**
- **EXTREME HEART CONDITIONS?**
- **ARE ASTHMATIC?**
- **ARE VERY OLD?**
- **ARE BLIND, DEAF MIDGETS WITH PARKINSON'S ?**

“Life is tough; it’s tougher when you’re stupid.”

John Wayne as SGT John Stryker

Sands of Iwo Jima

PERCEPTION

THE PROBLEM OF DIFFERING WORLD VIEWS

AIN'T IT AWFUL???

THE WORLD AS SEEN BY PHILOSOPHICAL GROUPS



THE WORLD AS IT IS



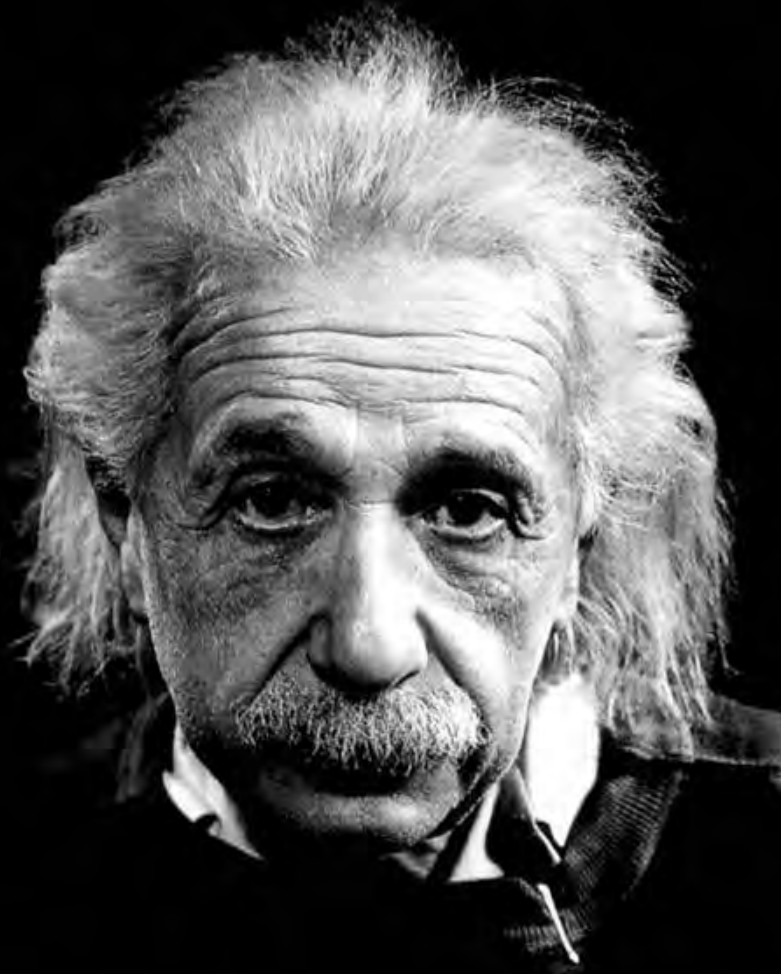
RECONSIDERATION OF ISSUES

- **WHAT PROBLEM ARE YOU SOLVING?**
- **COMPLAINTS BASED ON EMOTION VS. FACTS**
- **BLAME TECHNOLOGY FOR HUMAN PROBLEMS**
- **CHEMICAL & BIOLOGICAL AGENTS HAVE PEACEFUL PURPOSES**
- **MORE OPTIONS ARE PREFERABLE TO LESS**
- **THE RESULTS ARE IN: NLWS ARE NOT A ROAD TO HELL**



THE PRIMARY QUESTION SHOULD BE:

COMPARED TO WHAT?



“There are two things that are infinite.....the universe and human stupidity. And I’m not sure about the former.”

COMING SOON TO A COMMUNITY NEAR YOU

NLWS: NOW MORE THAN EVER



NOW IT'S YOUR KIDS IN THE SCHOOL: WHAT WEAPONS DO YOU WANT POLICE TO USE??



Effectiveness

Dose Response – Endpoints

- Effective Concentrations
- Health Effects
- Routes of Entry

Physical Characteristics – e.g. particle size, yield

Variables – Environmental

- Motivation

Modeling and Simulation

Routes of Entry

- **Inhalation** – Lower respiratory (1-5 microns)
 - Upper respiratory (1-100 microns)
- **Eye effects** – large and small particles, liquid
- **Cutaneous** – skin effects, large particles, liquid

Solvents and Propellants (examples)

Solvents

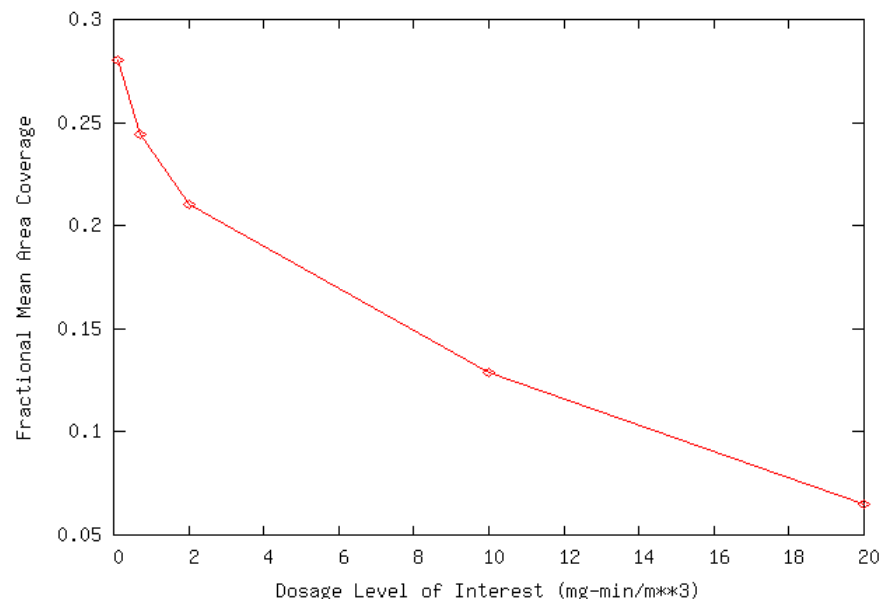
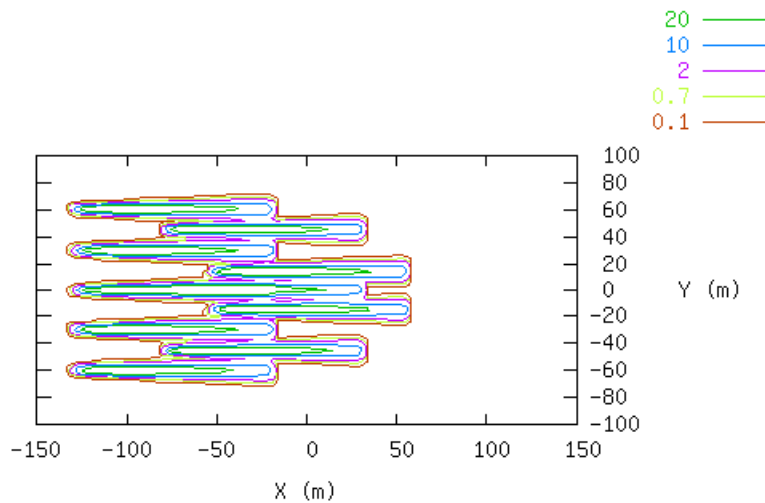
1,4 Dioxane
1,1,1, trichloroethane
Isopropyl alcohol
Methyl isobutyl ketone
Methylene Chloride
Trichloroethylene
Ethanol
Soy oil
Propylene glycol
Water

Propellants

Dymel Blend
Iso-butane
Nitrogen
Carbon dioxide

NL Modeling/Simulation

- Computer simulations predict the effects from the dispersion of NL chemical devices
- Analysis (e.g., Monte Carlo simulation) provides assessment of NL system feasibility



Less-Lethal Program



National Institute of Justice

Office of Science and Technology

Research and Technology Development Division

NDIA - NLD VI

March 16, 2005

Joe Cecconi
Senior Program Manager
202-305-7959
cecconij@ojp.usdoj.gov

Department of Justice

**ATTORNEY
GENERAL**

DEPUTY AG

ASSOCIATE AG

Office of Justice Programs

**AMERICAN INDIAN
AND ALASKAN
NATIVE DESK**

**OFFICE OF THE
ASSISTANT
ATTORNEY GENERAL**

**EQUAL
EMPLOYMENT
OPPORTUNITY
OFFICE**

**OFFICE OF POLICE
CORPS AND LAW
ENFORCEMENT
EDUCATION**

**DRUG COURTS
PROGRAM OFFICE**

**EXECUTIVE OFFICE
FOR
WEED AND SEED**

**VIOLENCE AGAINST
WOMEN OFFICE**

**OFFICE CHIEF
INFORMATION
OFFICER**

**OFFICE OF
THE
COMPTROLLER**

**OFFICE OF
GENERAL
COUNSEL**

**OFFICE OF
COMMUNICATIONS**

**OFFICE OF
BUDGET AND
MANAGEMENT
SERVICES**

**OFFICE OF
ADMINISTRATION**

**OFFICE FOR
CIVIL RIGHTS**

**BUREAU OF
JUSTICE
ASSISTANCE**

**BUREAU OF
JUSTICE
STATISTICS**

**NATIONAL
INSTITUTE
OF JUSTICE**

**OFFICE OF
JUVENILE
JUSTICE AND
DELINQUENCY
PREVENTION**

**OFFICE FOR
VICTIMS OF
CRIME**

Mission of NIJ

- The R&D arm of the Department of Justice
- Has no operational mission
- Two major areas of responsibility
 - Behavioral research
Office of Research and Evaluation (ORE)
 - Physical science research
Office of Science and Technology (OS&T)
 - Support Approximately 18,000 LE agencies
 - Support Approximately 3,000 Correctional agencies
 - Support Civilian Agencies w/o formal LL programs
 - Support first responders

NIJ's Technology Centers

NIJ

Memorial Institute for the Prevention of Terrorism

Oklahoma City, OK

Institute for Security Technology Studies

Hanover, NH

Rural LE Technology Center

(2001)

Hazard, KY

NLECTC Northeast

Rome, NY

NLECTC National

Rockville, MD

Office of Law Enforcement
Standards

Gaithersburg, MD

Office of Law Enforcement
Technology Commercialization

Wheeling, WV

WVU Forensic Identification Program

Morgantown, WV

Marshall University Forensic
Science Center

Huntington, WV

NLECTC Southeast

Charleston, SC

National Center for
Forensic Science

Orlando, FL

National Forensic Science
Technology Center

St. Petersburg, FL

Center for Civil Force Protection
School Security Technology Resource Center
(Sandia National Laboratories)

Albuquerque, NM

Border Research
& Technology Center

San Diego, CA

NLECTC West

El Segundo, CA

NLECTC Rocky Mountain

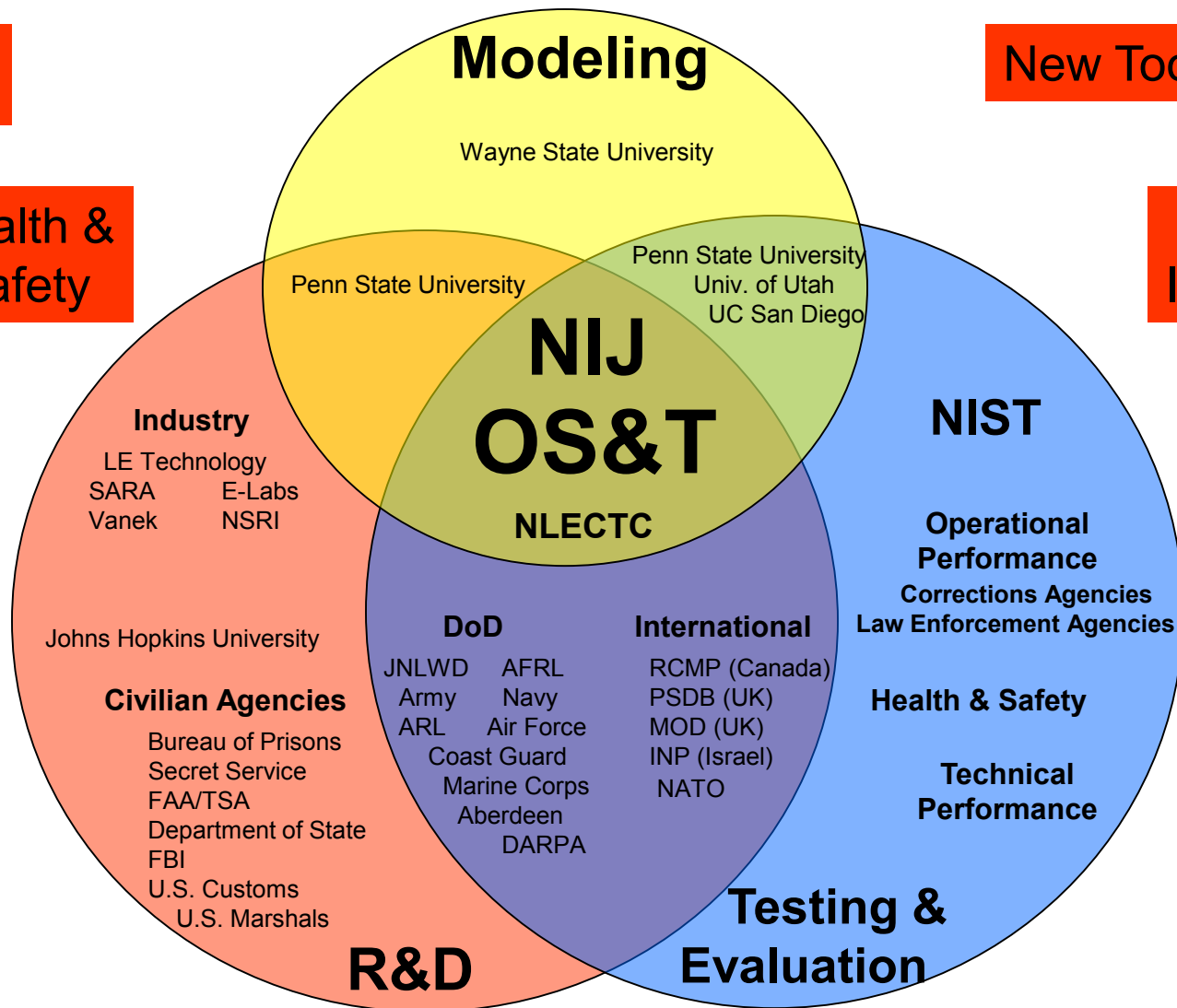
Denver, CO

NLECTC Northwest

Anchorage, AK

- ☆ - National Law Enforcement & Corrections Technology Centers serving specific regions
- - Specialty Offices and Centers
- ▲ - Forensic Resource Network

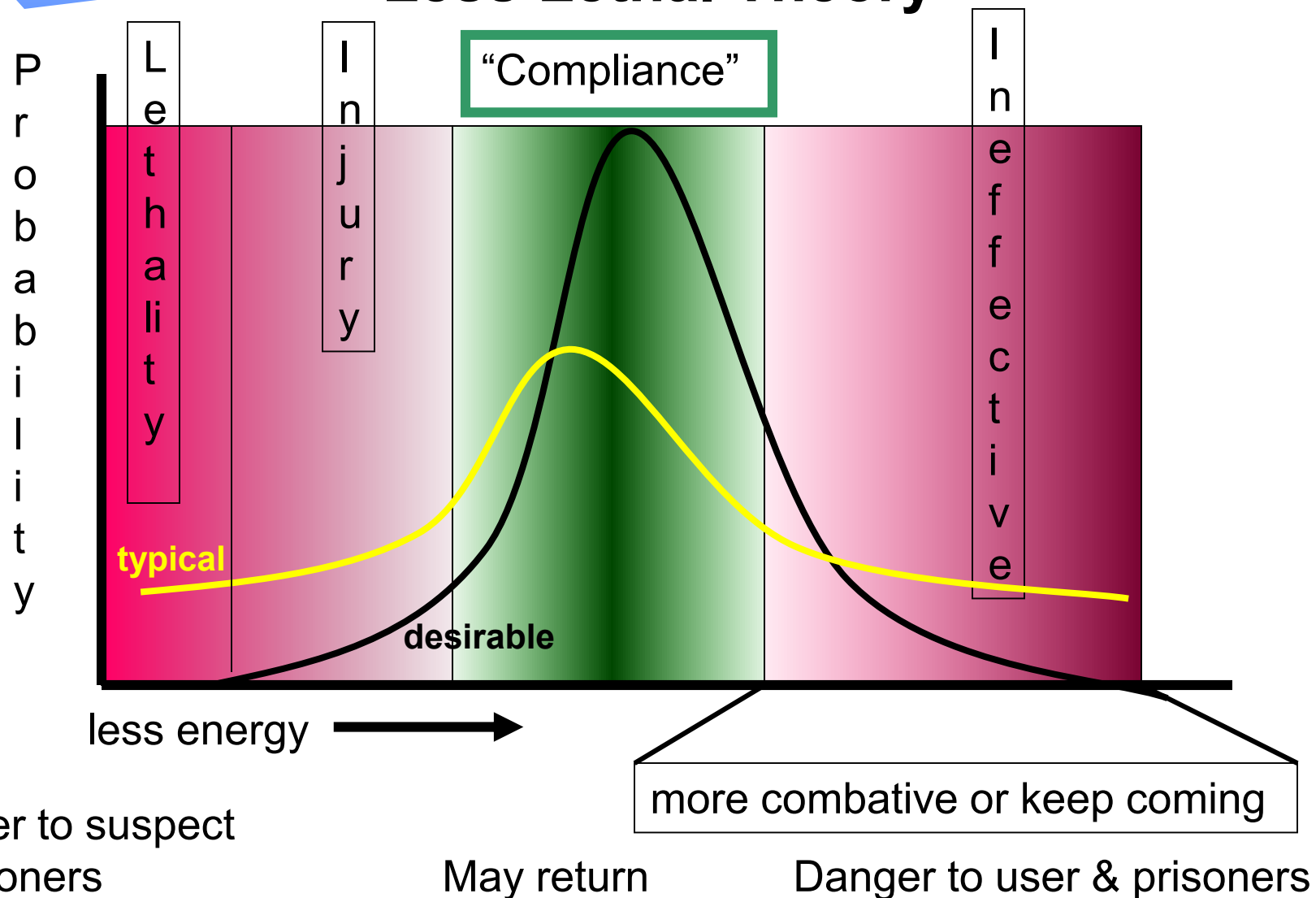
Less-Lethal Program

NIJ**Goals:****Health & Safety****New Tools****Distribute Information**

Less-Lethal Program

NIJ

Less Lethal Theory



Less-Lethal Program



THE “TWO” TYPES OF LL DEVICES

Primary Focus:

- Devices which “incapacitate”
Items you have no choice
Suspect is immobilized
“Involuntary” compliance

Secondary Focus:

- Devices which “provide an edge”
Items that distract, dissuade, deter, etc.
“Voluntary”/smart compliance

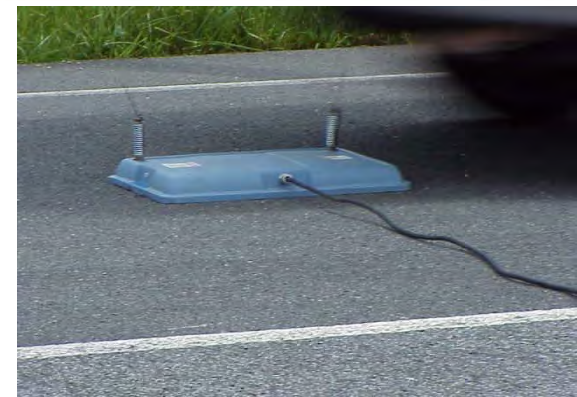
Less-Lethal Program

NIJ



- **Less-Lethal Incapacitation**

- Blunt Trauma
- Electrical
- Chemical (Pepper)
- Light/Laser
- Nets
- Acoustic
- Pursuit Management
- Modeling and Evaluation



Less-Lethal Program



Less-Lethal for Homeland Security

LL in Aircraft

LL in Airports

State & Local folks protect your airports

Get new LL devices to airports for review:

TAPAM, Xnet, PADS, MDS, etc.

LL in Quarantine scenarios

Less-Lethal Program

NIJ

Less-Lethal DOD vs. LEC Requests

Typical DOD

Range

100 to 5000 ft.

Typical LE

0 to 100 ft.

Size/Weight

Vehicle mount or smaller

Person portable

Cost

Tolerate higher costs

\$750 or less

Operations

Combine Lethal with NL
Central purchasing

Separate L & LL
Each agency

Less-Lethal Program

NIJ



Less-Lethal - Directed Energy



What about Directed Energy Devices ?

Consider the following prototype characteristics:

Min. Range	50 feet [w/ranging]
Energy	Intense heat [<1 sec]
Effected Area	28 sq in [3" dia]
Number of shots	12 [magazine]
Size	Shotgun
Intensity	Adjustable
Safety Consideration	Eye Safe

Less-Lethal Program



“Force on Target”/ enabling technology - eye safety:

Measure range/position using the red eye effect:

Has the potential to aid in aiming & improving safety

- A place to avoid

- A reference from which to aim around

- A place to aim at

- Discriminate between animal or man

- The “Electronic Safety” on a weapon

Less-Lethal Program

NIJ

New Pilot Programs:

Directed Energy:

Mapping current flow through body [TASER]

RF based LL Device [weapon]

Optical based LL Device [weapon]

Electronic Flashbang [short duration laser/fiber amp]

Smart Dazzler and Associated concept

Miniaturized Sticky Shocker – funding cut

Less-Lethal Program

NIJ

New Pilot Programs:

Blunt Trauma:

RAP development

RAP Independent testing

LL Databases/Information:

LL database – mine existing, find new

Mine LASD database for TASER use

Prospective LL database - Wakeforest

ILEF conference & Prague

Less-Lethal Program



New Requests/Solicitation 06:

Human Effects:

RF/Optical – short pulse application

Is reflex response via arch possible, Targeting simplified

Human susceptibility – new exploits for LL

Device Development:

Eye detector development

LL Databases/Information:

LL db – mine existing & collect at scene - NHTSA model

– detailed analysis [lawyers, med, scientist, LEC, etc]

Can Training facilities be used to obtain LL data

Less-Lethal Program



Find Us on the Web:

- National Institute of Justice (NIJ)
Home Page: www.ojp.usdoj.gov/nij
- Justice Technology Information Network (JUSTNET)
Home Page: www.nlectc.org
- Justice Information Center (National Criminal Justice Reference Service)
Home Page: www.ncjrs.org

Less-Lethal Program



Other LL sites on the Web:

- Pennsylvania State University
Home Page [INLDT]: www.nldt.org
- Joint Non-Lethal Weapons Directorate (JNLWD)
Home Page: www.jnlwd.usmc.mil
- University of New Hampshire
Home Page [NTIC]: www.unh.edu/ntic

Less-Lethal Program

NIJ

QUESTIONS ??

Army Non-lethal Requirements

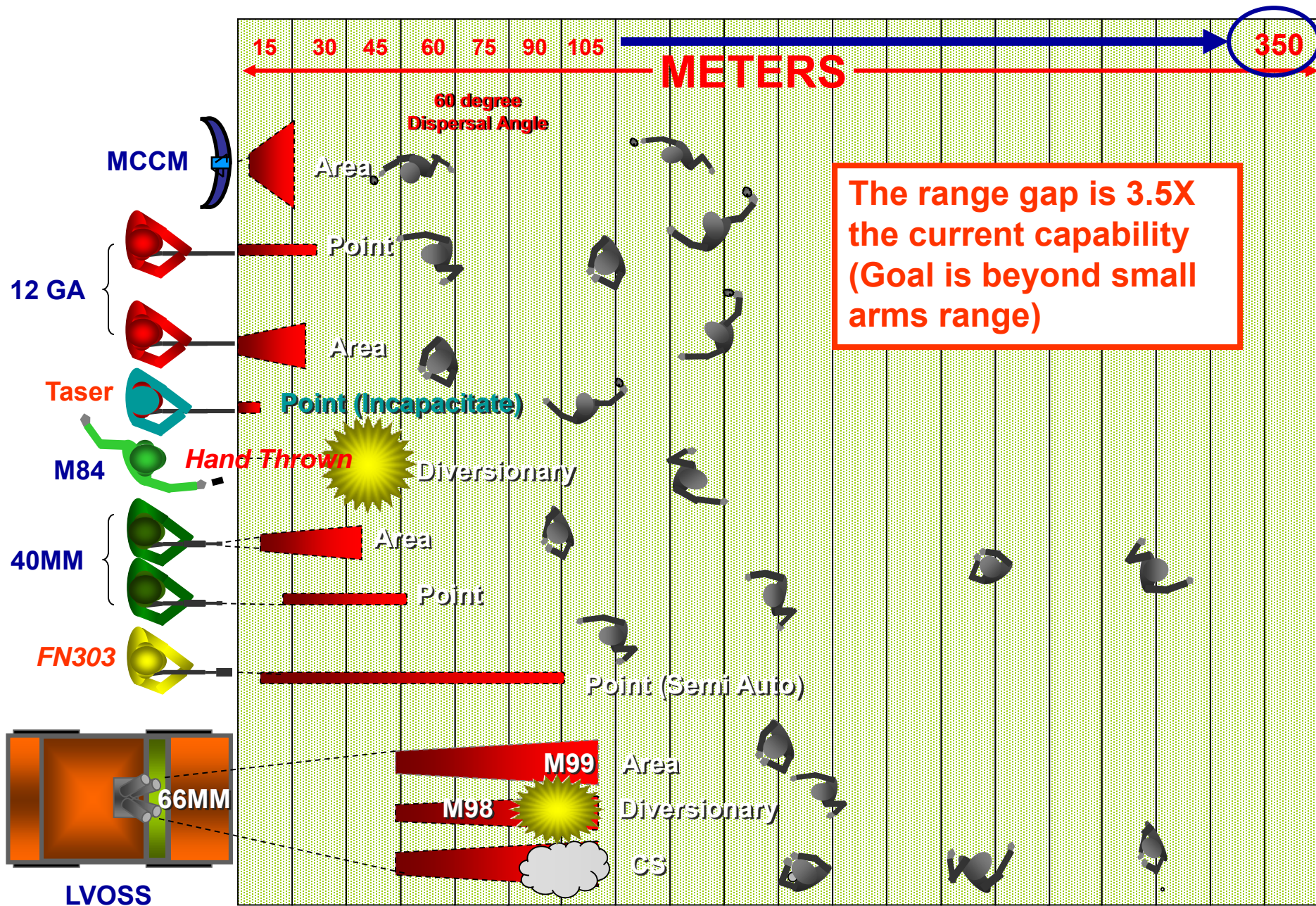
14 March 2005

Gaps

Immediate Needs

- Extended weapons range (small arms distance) that delivers intended effect is the Army's most pressing gap
- Protecting convoys has emerged as a major requirement
- Stopping vehicles remains a major challenge to forces (at static sites, from convoys, etc)

Non Lethal Munitions Effective Ranges



Extended Range Initiatives

- Extended Range Blunt Impact Capabilities
 - Airburst Nonlethal Munitions (ANLM)
(Army CDD in progress)
 - Others (FN303, MASS, 12 ga, 40mm)
- Directed Energy Weapons (DEW)
(Signature to Joint CDD)
 - Static ADS
 - Portable ADS (PADS)
- Acoustic Capabilities (Starting Army CDD)



Commander Sid Heal, LASD



John M. Kenny, PhD, MBA

Behavioral and Medical Outcomes of Nonlethal Weapons Use



W. Bosseau Murray, MD, FFA



Viktor E. Bovbjerg, PhD MPH

LASD Force Data

Supervisor's Report on Use of Force

Page 2 of

Method

URN:

(AW) Arwen	(FH) Firearm (Handgun)	(PO) Personal Weapon (Other)
(BC) Baton: (Control)	(FR) Firearm (Rifle)	(RS) Resistance
(BI) Baton: (Impact)	(FS) Firearm (Shotgun)	(CN) Restraint Device (Capture Net)
(BF) Bodily Fluids	(FO) Firearm (Other)	(RH) Restraint Device (Handcuffs)
(CN) Canine	(FB) Flashbang	(HB) Restraint Device: Hobble (Legs Only)
(CR) Carotid Restraint	(FL) Flashlight	(TP) Restraint Device: Hobble (TARP)
(CH) Choke Hold	(OE) Other Weapon: Edged	(RE) Restraint Device: REACT Belt
(CT) Control Holds: (Control Techniques)	(OV) Other Weapon: Vehicle	(SP) Sap
(TT) Control Holds: (Team Takedown)	(OB) Other Weapon: Blunt Object	(SH) Shield
(TD) Control Holds: (Takedown)	(OO) Other Weapon: Other	(SG) 37mm Stinger
(CE) Chemical	(PK) Personal Weapon: Feet/Leg: (Kick)	(SB) Sting Ball
(OC) Chemical Agents (OC Spray)	(PS) Personal Weapon: Feet/Leg: (Sweep)	(ST) Stun Bag
(TG) Chemical Agents (Tear Gas)	(PH) Personal Weapon (Hand/Arm)	(TR) Taser
(EX) Explosives	(PP) Personal Weapon (Push)	(UC) Uncooperative

Type of Injury

(AB) Abrasion	(DB) Dog Bite	(PA) Paralysis
(BR) Bruise	(FR) Fractures	(PW) Puncture Wound
(BU) Burn	(GS) Gunshot	(SD) Soft Tissue Damage
(CP) Complaint of Pain	(HB) Human Bite	(ST) Sprain/Twists
(CO) Concussion	(LC) Lacerations	(UN) Unconscious
(DH) Death	(ND) Nerve Damage	(RM) Refused Med Treatment
(DI) Dislocation	(OD) Organ Damage	(NN) NONE

Body Part Injured

(AD) Abdomen	(FA) Face	(HI) Hip
(AK) Ankle	(FE) Feet	(IN) Internal
(AR) Arm	(FI) Fingers	(KN) Knees
(BK) Back	(GE) Genitals	(LE) Leg
(BT) Buttocks	(GR) Groin	(NK) Neck
(CH) Chest	(HD) Hands	(NO) Nose
(EL) Elbow	(HE) Head	(SH) Shoulder
		(WR) Wrist

FORCE APPLIED

(Only One Code Per Block)

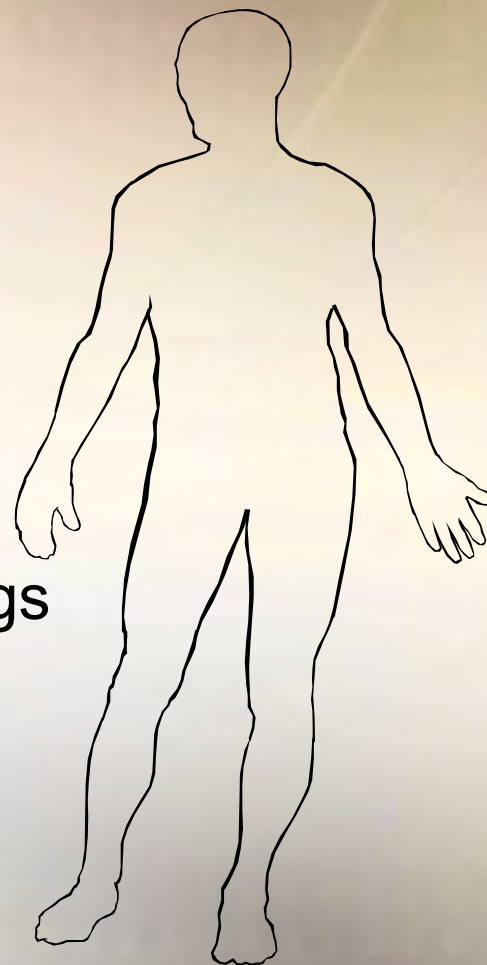
Used By (E# or S#)	Used Against (E# or S#)	Method (Code)	Type of Injury (Code)	Body Part (Code)

Study Objectives

- All LASD force data 1995-2004
 - $N > 21,000$
- Weapons, range, clothing, environment, injuries, countermeasures, effects on “target,” estimate of effectiveness, etc.
- Most comprehensive study of its kind
- Identify trends (study covers a decade)
- A work in progress!
 - Final report due about April 2005

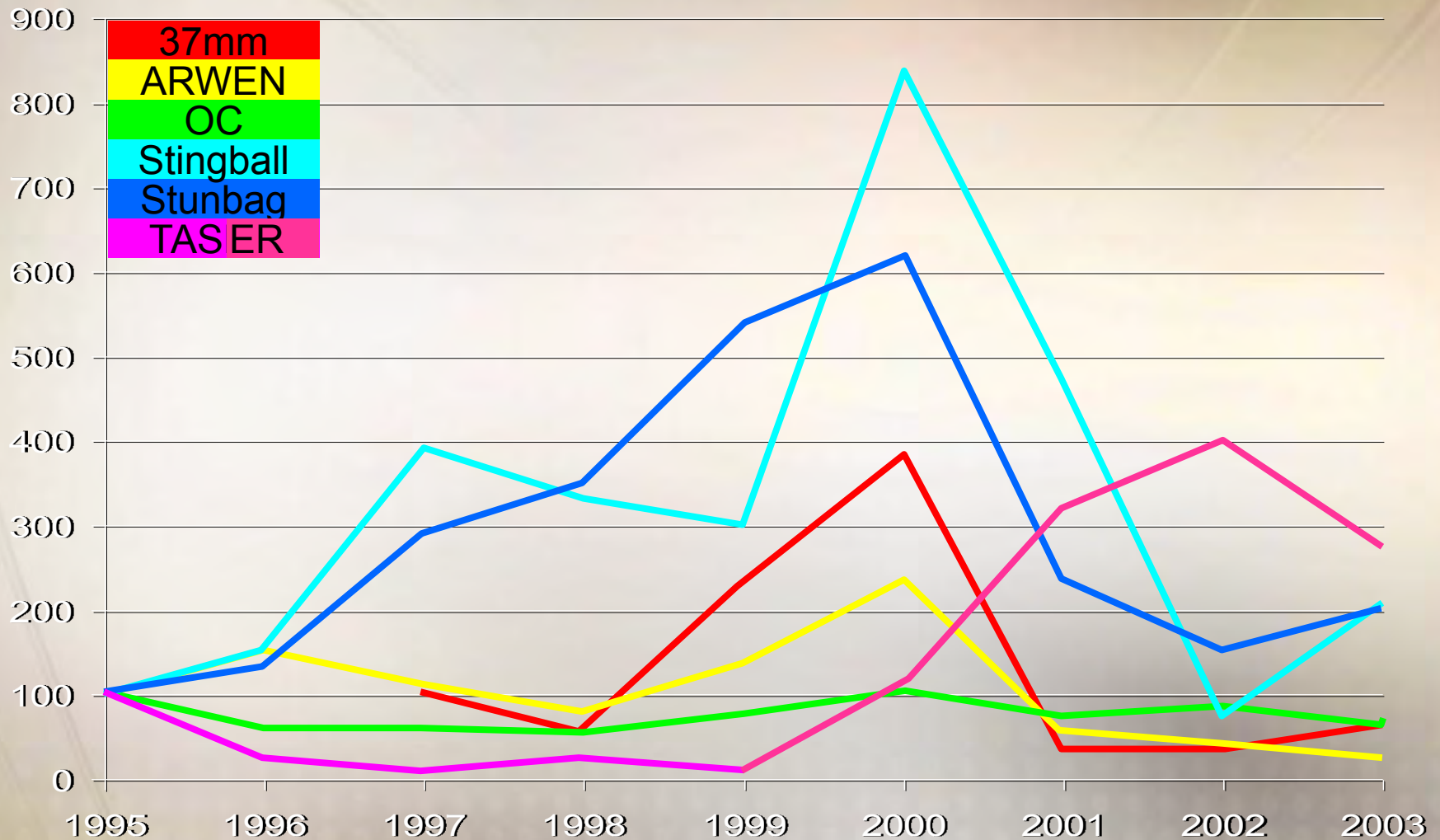
Suspect Info

- Weighed an average of 173 pounds (78 kilograms)
- 4% were armed with firearms
- 24% had a criminal history
- 5% had a mental health history
- 23% were under the influence of drugs and/or alcohol
 - 71% of these were at least alcohol
 - 21% were using stimulants relevant for TASER death hypotheses



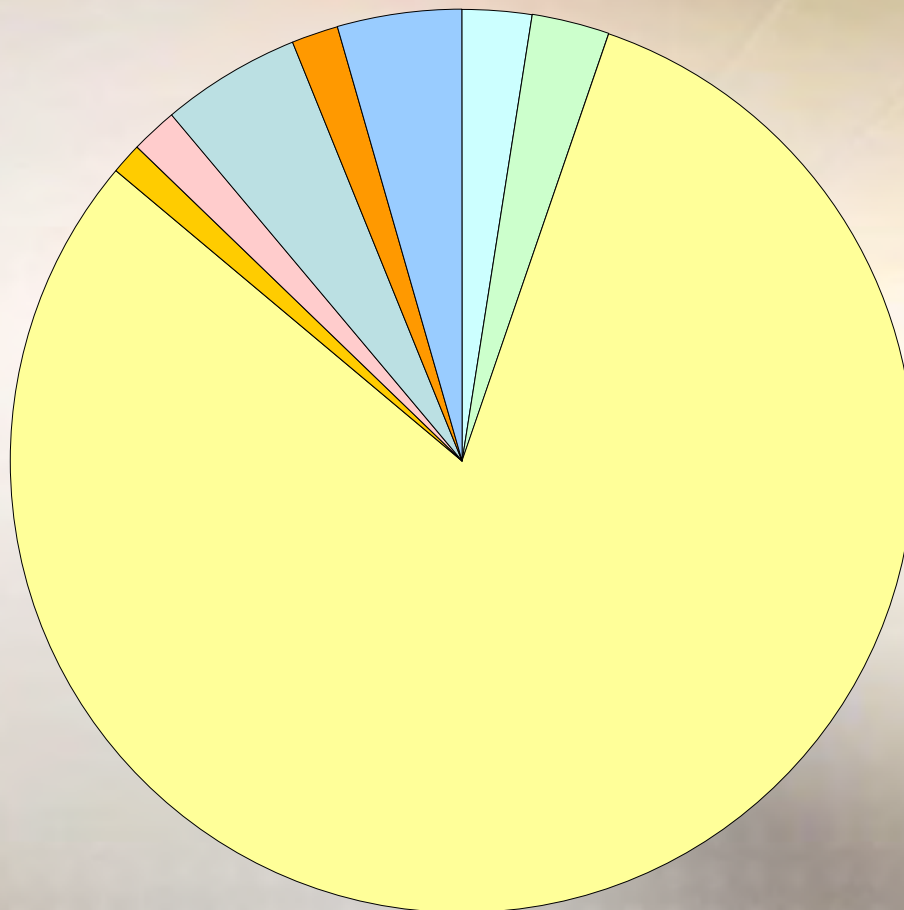
LASD NLW weapon use by year, 1995-2003

(as % change from 1995)



Types of Force Used (1995-2004)

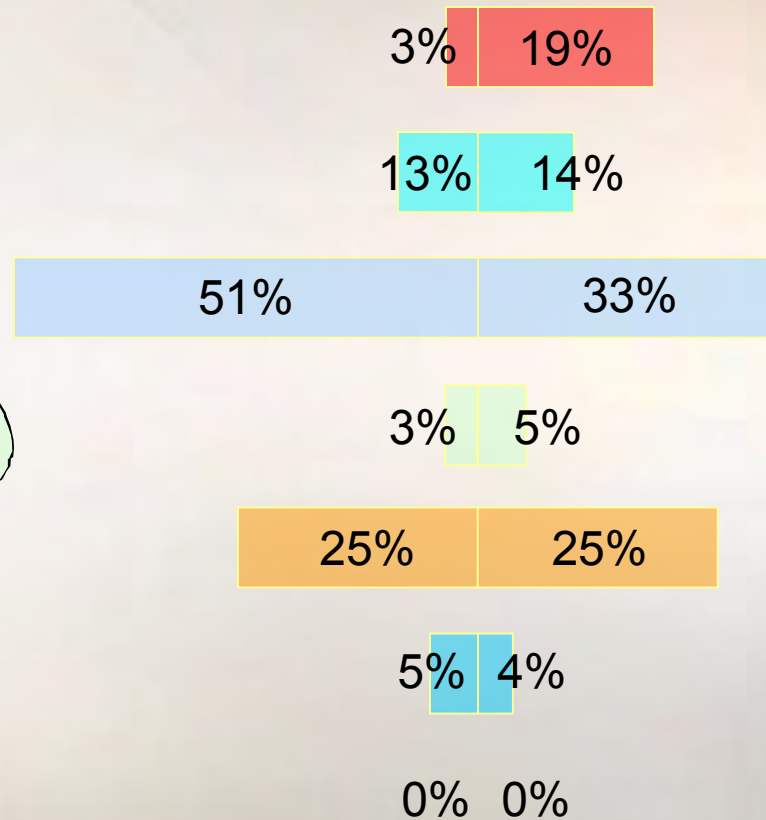
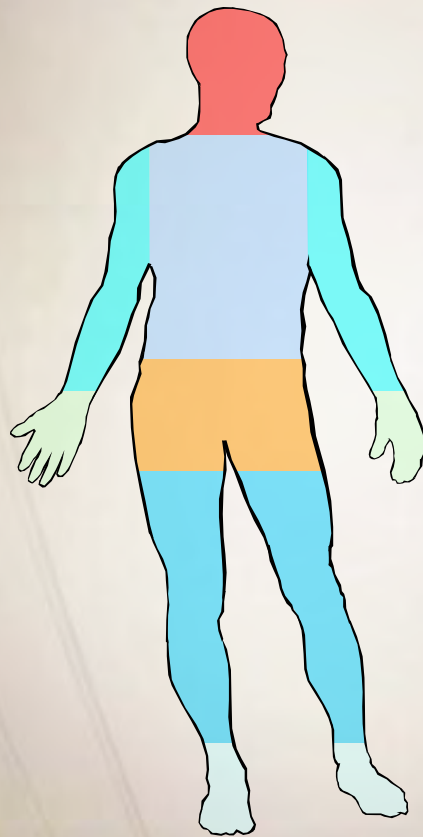
Riot Control Agents	1%
Canine	2%
Stingball	5%
Stunbag	2%
Taser	4%
37mm	2%
Baton	3%
OC (Pepper Spray)	81%



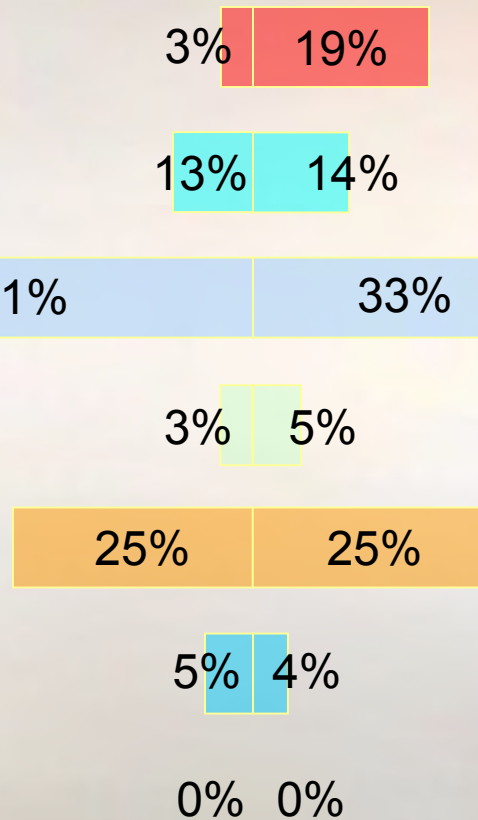
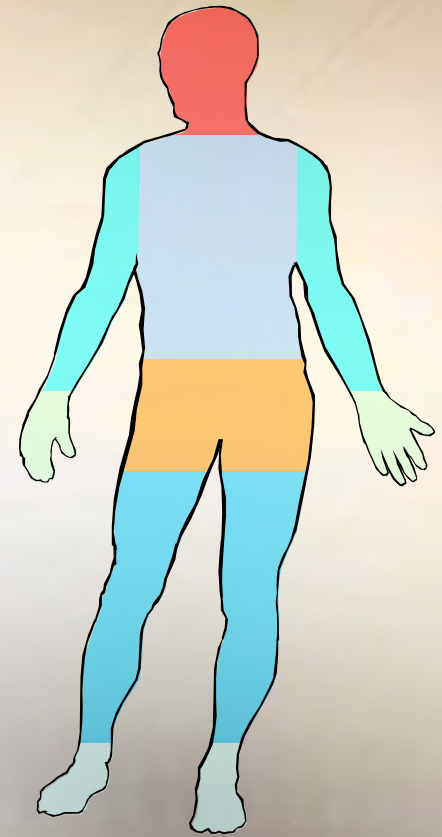
N = 15,573

Strike Sites—TASER & ARWEN

TASER



ARWEN



Questions?

(or notification of availability of report)

Commander Sid Heal

Los Angeles Sheriff's Department
4700 Ramona Ave.
Monterey Park, CA 91754

323-526-5466

CSHeal@lasd.org

"IF THE CROWD DOESN'T STOP, THEN
WE'RE GOING TO DEPLOY PRIVATE
JACKSON'S MALODOUROUS SOCKS!"





Non-Lethal Weapons - *Academic Initiatives at Penn State*

LTC Ed Hughes (USA-Ret)
Institute for Non-Lethal Defense Technologies
Applied Research Laboratory
The Pennsylvania State University

16 December 2004

Penn State Activities

- Research & Development
- Testing & Evaluation
- Education & Training

Common Thread of Training

- John Alexander: “The issue on deaths [with non-lethals] is training.”
- MSG Godwin: [As we introduce] these systems, they need to be easily trained.”
- Col Karcher: talked about the importance of INIWIC.
- MG Lott asked why Soldiers and Marines would choose a non-lethal option and concluded “training and experience.”
- CAPT Merritt said that operators were the most credible spokespersons for non-lethals and that trained and educated soldiers are a crucial part of the public affairs effort.

Penn State NL Education and Training Activities

- Joint Professional Military Education (Ron Madrid);
- Distributed Training;
- Mobile/Resident Training Support;
- Proposed Training and Education Work.

Penn State NL Education and Training Activities

- Joint Professional Military Education (Ron Madrid);
- Distributed Training;
- Mobile/Resident Training Support;
- Proposed Training and Education Work.

The Future of NL Education and Training

- “Training” versus “Education”
- Need to systemically address the NL training challenges (more prolific; sustain standards)
- Need to fill the NL training gap by addressing short term needs with a view to the long term “vision”
- Establish a NLW Master Gunner program
- Ensure COTS systems come with training support packages reviewed by INIWIC for utility
- Services need to invest seriously in INIWIC





Non-Lethal Weapons in the Global War on Terrorism

Getting it Right”

Lt Gen Jan C. Huly, USMC

Chairman, DoD Joint Non-Lethal Weapons Program



World Wide Capabilities





World Wide Deployments



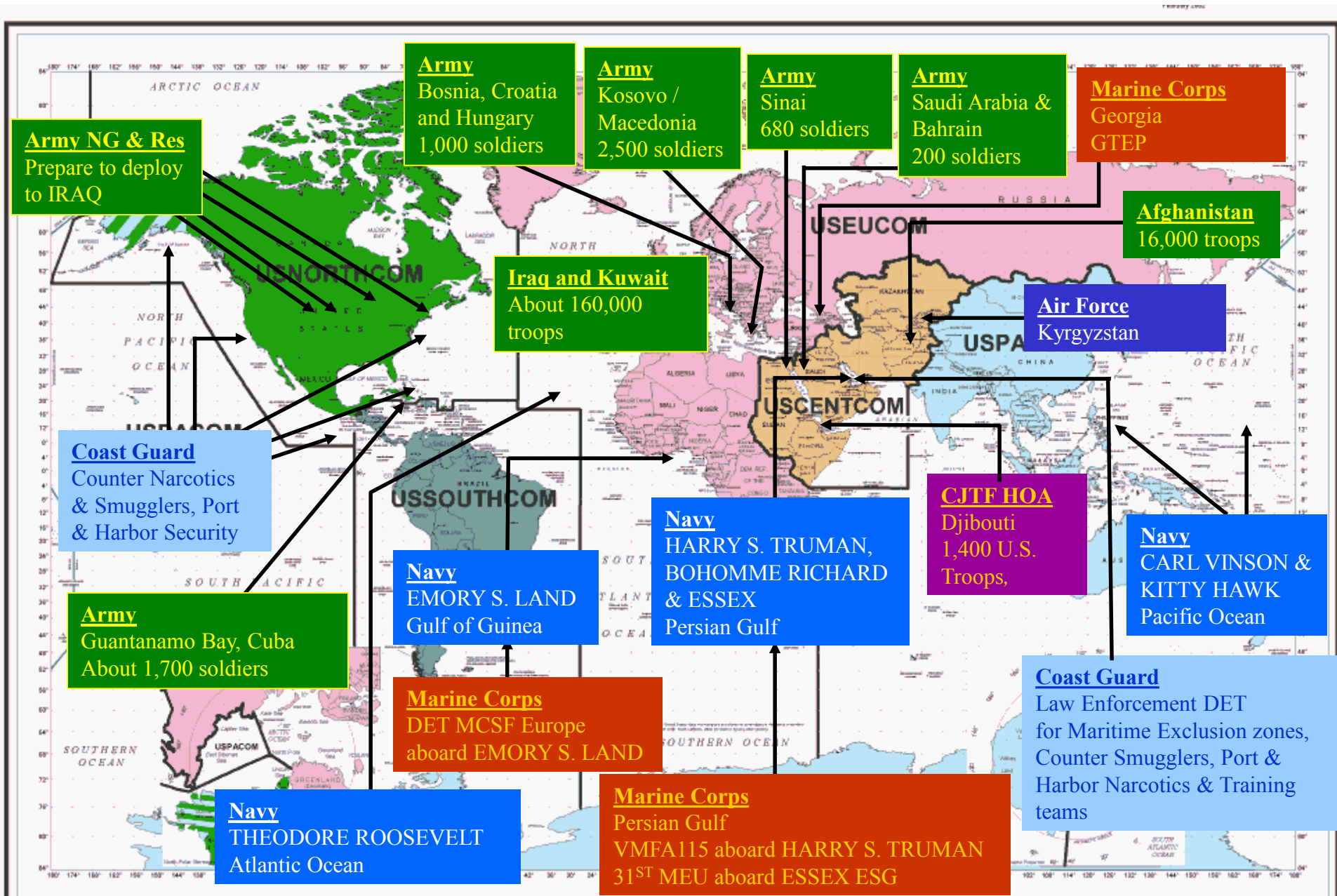
- US Forces are deployed worldwide in the Global War on Terrorism
- What Current Challenges do we face?



World Wide Environments



US FORCES DEPLOYED GLOBALLY





Today's Realty

Complex Environments

Non-Traditional Threats



Unclear Enemy

Challenging Situations





Three Block War



**Peacekeeping
Peace
Enforcement**



**Intense
Combat:
Company
and
Platoon
Attacks**

**Inside 9 story
Building**



**Humanitarian
Assistance**



Today's NL Mission Set

- We are performing a multitude of missions and tasks
 - USAF providing security for ground convoy operations
 - Tankers are performing security / policing missions
- We are performing a variety of mission task against an asymmetric threat; often simultaneously.
 - Combat operations against insurgents
 - Law Enforcement missions with host nation officials
 - Peacekeeping operations
 - Humanitarian missions



How can Non-lethal weapons help mitigate these challenges?



- Deny Critical areas
- Stopping vehicles / vessels
- Separating terrorists from the innocent population
- Secure personnel / equipment
- Vehicle-borne Improvised Explosive Devices





Non-Lethal Weapons

- New Tools to Help The Warfighter
- *Compliments, Not Replaces Lethal Weapons*
- More Options Between the Bullet and the Bullhorn





Non-Lethal Weapons: *Today*

- Basic, “Low Tech” Capabilities
- Generally used by Military Police / Security Forces
- Principally used for crowds, detainee ops, checkpoints



NLW Use in Iraq

" I had requested the NLW off the ships in Kuwait and took it with us into Iraq. NLW was worth it's weight in gold. One night they were coming through holes in the walls and looting the quartermaster's buildings inside our perimeter. ... The H&S Co CO ran over to me and asked if we had NLW. Within 10 minutes we were able to clear about a 1,000 people. We used a variety of rounds. We later employed them from time to time when the circumstances dictated during stabilization operations.

Major, USMCR





Urgently Fielded Items



- What Non-lethal weapons have we urgently fielded?
 - VLAD (vehicle lightweight arresting device)
 - FN303 Non-lethal launcher
 - M/X-26 Tasers
- How do they help address these challenges?





The Future of NLWs **“Desired Effects”**

NLWs Today: Close-in, Low Tech
(NL effects only 50-200 feet)



NLWs Tomorrow: Longer range, More
Effective (NL effects @ > small arms range)

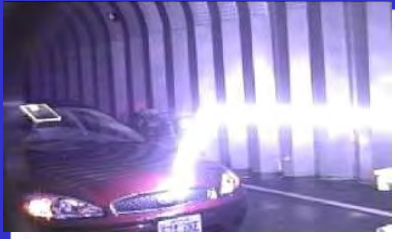


Non-Lethal Weapons: *Tomorrow*

- Longer Range, “Higher Tech”
- Integrated among all forces
- Used for disabling vehicles, denying area to personnel, crowds, stopping vessels, determining intent



What do we Need from NLW



Speed of Light Closure

- Near-real time effects upon trigger pull from 1 to 10's of km
- Impossible to outmaneuver
- Rapid retargeting

Precision Engagement

- Select the target and the aimpoint
- Minimum collateral damage

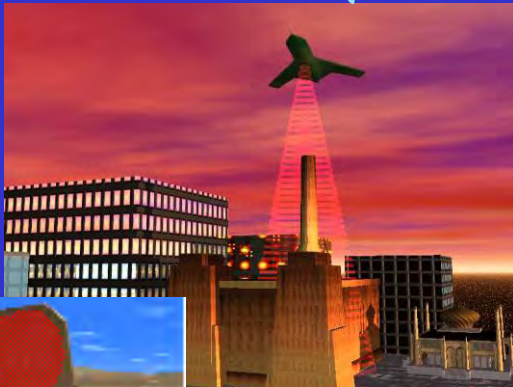


Controlled Effects

- Scalable effects from deny to destroy: *counter-material*
- *Non-lethal human applications*

Logistics Advantages

- Low cost per shot
- Deep magazine without shelf-life or stockpile issues



We need Capabilities to stop Vehicles



We must be able to stop vehicles at a safe distance to determine if they are friend or foe...





We need Capabilities to Deny Area to Personnel

We have limited capabilities to
deny personnel to Coalition
controlled areas



Chris Hondros / Getty Images

Most NLW/C effective
ranges have extremely
limited stand-off distance





We need Capabilities to Protect and Separate Tourist from Terrorist





How Industry Can Help

- Review your ideas, concepts, and technological breakthroughs through a non-lethal weapons filter
- Ask yourself:
 - How can I stop a vehicle without destroying it?
 - How can I stop a vessel without sinking it?
 - How can I keep personnel away from a building without shooting them?
 - How can I get personnel out of a building without entering it?
 - How can I do these things at maximum standoff range with minimum risk to others and our troops?



United States Coast Guard



Non-Lethal Defense VI Symposium

RADM David Kunkel

Director of Operations Capability



Successful Non-Lethal Illegal Alien Interdiction Case



MK10 Surface Launched
Running Gear Entanglement System
(RGES)



27 ft Coast Guard Response Boat



Successful Non-Lethal Illegal Alien Interdiction Case



35 ft Cigarette with 38 illegal aliens on board



Successful Non-Lethal Illegal Alien Interdiction Case



Port outboard entangled



Successful Non-Lethal Illegal Alien Interdiction Case



Video



Desired Capabilities



- Stopping non-compliant vessels
 - Need a lighter more portable system
 - Need a air deployable system
- Anti-Swimmer – underwater devices to interdict swimmers and divers
- Clear Spaces – need a non-sparking flash-bang grenade type device
- Anti-personnel – need to control or take down a person within a maritime environment



Non-Lethal Weapons: Technologies, Concepts and Strategies

A Course of Instruction at the Military War Colleges

Presented by:

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Marine Corps Research University, Penn State

Outline

- **Course Genesis**
- **Course Composition**
- **Venues**
- **Student Scenarios**

Course Genesis

- **The course was created in 1998 after the formation of the Institute for Non-Lethal Defense Technologies at Penn State.**
- **The course was created and is taught by Penn State and offered for presentation at various DoD military colleges.**
- **The purpose of the course is to expose field commanders and staff officers to the capabilities and limitations of non-lethal weapons across the spectrum of conflict.**

Course Composition

- **The course is 24-30 hours of instruction depending on the academic venue.**
- **It is composed of both classified and unclassified lectures by subject matter experts and is currently only open to U.S. students.**
- **DoD and industry subject matter experts provide lectures on non-lethal technologies and/or the implications of their use.**

Course Overview

- **The course covers:**
 - **the history of the non-lethal weapons program**
 - **current military uses of NL weapons**
 - **threat non-lethal weapons**
 - **current/future DoD non-lethal weapons programs**
 - **the status of non-lethal technology development**

Course Overview

- **The course also covers the implications of non-lethal weapons use.**
 - **political implications**
 - **rules of engagement**
 - **public perception – awareness**
 - **ethical considerations**
 - **legal implications**
 - **impact on policy, strategy and doctrine**
 - **support to Homeland Defense**

Resources

- **Future War: Non-Lethal Weapons in 21st Century Warfare by Col John Alexander, USA (Ret)**
- **Studies and Assessments of Non-Lethal Technologies by Independent Research Organizations**
- **Military Journal Papers**
- **Press Articles**

Non-Lethal Course Venues



- **National Defense University**
 - **First non-lethal class conducted in 1999.**
 - **Two classes held in 2004.**
 - **Total of 48 students have taken the course.**

Non-Lethal Course Venues



- **Marine Corps Command & Staff College**
 - **Five courses conducted since 2000.**
 - **Total of 74 students have taken the course.**



Non-Lethal Course Venues

U.S. ARMY WAR COLLEGE
at historic Carlisle Barracks, Pennsylvania

- **Army War College**
 - **First course conducted in 2004.**
 - **Total of 22 students have taken the course.**

2005-2006 Non-Lethal Course Venues



U.S. ARMY WAR COLLEGE
at historic Carlisle Barracks, Pennsylvania



THE NATIONAL WAR COLLEGE



INDUSTRIAL COLLEGE OF THE ARMED FORCES

Marine Corps Command & Staff College



NAVAL WAR COLLEGE
NEWPORT, RHODE ISLAND



- April – June 2005
- April – June 2006
- Sept – Nov 2005
- Jan – Mar 2006
- Jan – Mar 2006
- AY 2005 – 2006
- Aug – Oct 2005
- Spring 2006

2005-2006 Venues In-Work



- AY 2005 – 2006



- AY 2005 - 2006

Command & General Staff College

Fort Leavenworth, Kansas

Students

- **Majors/LtCdrs – LtCol/CDR - Colonel/Captain**
- **Representation from all combat and supporting arms.**
- **GS-14/GS-15s from OSD and the military services.**
- **90% of the students start the course as skeptics.**
- **99% of the students leave the course as advocates.**

Student Non-Lethal Scenarios

- **Course final exam.**
- **Student teams are tasked to develop a scenario based on historical, current or future events.**
- **Scenario must integrate non-lethal technologies and show how their use would impact mission accomplishment.**
- **Student teams present their scenarios to a flag level panel of subject matter experts from the military and federal/state agencies.**

Student Non-Lethal Scenarios

- **1975 Evacuation of Saigon Embassy**
- **Maritime Interdiction**
 - **Piracy in SE Asia**
 - **Enforcing UN Sanctions Against Iraq**
- **Embassy Protection – Crowd Control**
 - **South America**
 - **Middle East**
- **Humanitarian Operations**
 - **LZ Protection – Food Distribution Point**
 - **Earthquake Relief**

Student Non-Lethal Scenarios

- Humanitarian Operations
 - Convoy Protection
- Non-Combatant Evacuation Operations
- I MEF Security of Iraqi Elections
- 2001 Presidential Inauguration
- Port Security
 - Long Beach
 - San Francisco
- Athens Olympics
- USS Cole

Student Non-Lethal Scenarios

- **Special Operation Forces – Snatch/Grab in Afghanistan**
- **Aircraft Hijacking**
 - **1985 TWA Flt 847**
 - **Prevention**
- **Hostages**
 - **29 May 04 takeover of Saudi Arabian housing compound**
- **1970 Kent State**
- **1863 New York Draft Riots**
- **Vehicle Checkpoint**
 - **Humanitarian Operations**
 - **An Najaf, April 2003**

NON-LETHAL WEAPONS



Col Bill Wetzelberger, USMC

COL Charles Tennison, USA

LTC Steph Twitty, USA

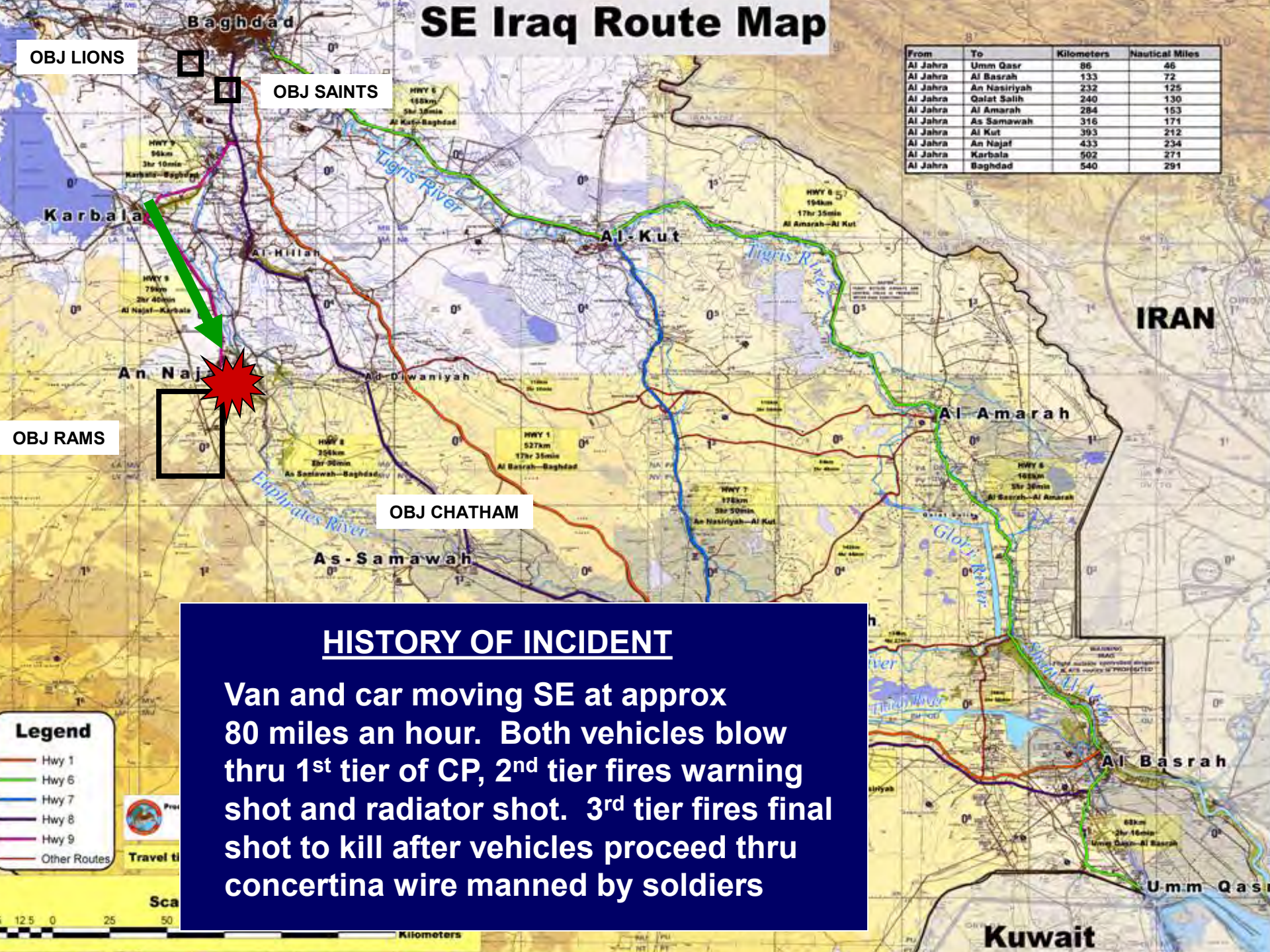
LtCol Mike Belding, USMC

**TASK FORCE 3-15 INFANTRY
CIVILIAN VAN INCIDENT
ALONG HIGHWAY 9, AN NAJAF**

SCENARIO

- **Task Force 3-15 Infantry located in blocking positions along HWY 9 vicinity of An Najaf in order to prevent enemy forces from flanking Task Force 4-64 AR from the north.**
- **Heavy fighting along HWY 9 between TF 3-15 IN and Iraqi soldiers in civilian cars / technical trucks**
- **Two US Soldiers killed the day prior by suicide bomber at a checkpoint**
- **Guidance to company commander:**
 - **Three blocking positions established with B/3-15 IN.**
 - **Prevent enemy forces from using HWY 9 to envelope main effort**
 - **Establish three-tier check point with concertina wire and Bradley Fighting Vehicles (BFV)**
- **Fire Warning shot over Car hood/ 2nd shot radiator/3rd to kill**

SE Iraq Route Map



HISTORY OF INCIDENT

Van and car moving SE at approx 80 miles an hour. Both vehicles blow thru 1st tier of CP, 2nd tier fires warning shot and radiator shot. 3rd tier fires final shot to kill after vehicles proceed thru concertina wire manned by soldiers

WHAT HAPPENED?

Direction of travel
of van

Two Bradley Fighting Vehicles (BFV) positioned north and south of the road as 2nd tier CP fire warning and radiator shots to disable van. Van proceeds through Concertina wire strung across road.

Two US Soldiers located in dug-in fighting positions along south side of the road attempt to halt van by waving it down.

Two BFVs positioned north and south of the road engage to destroy the van.

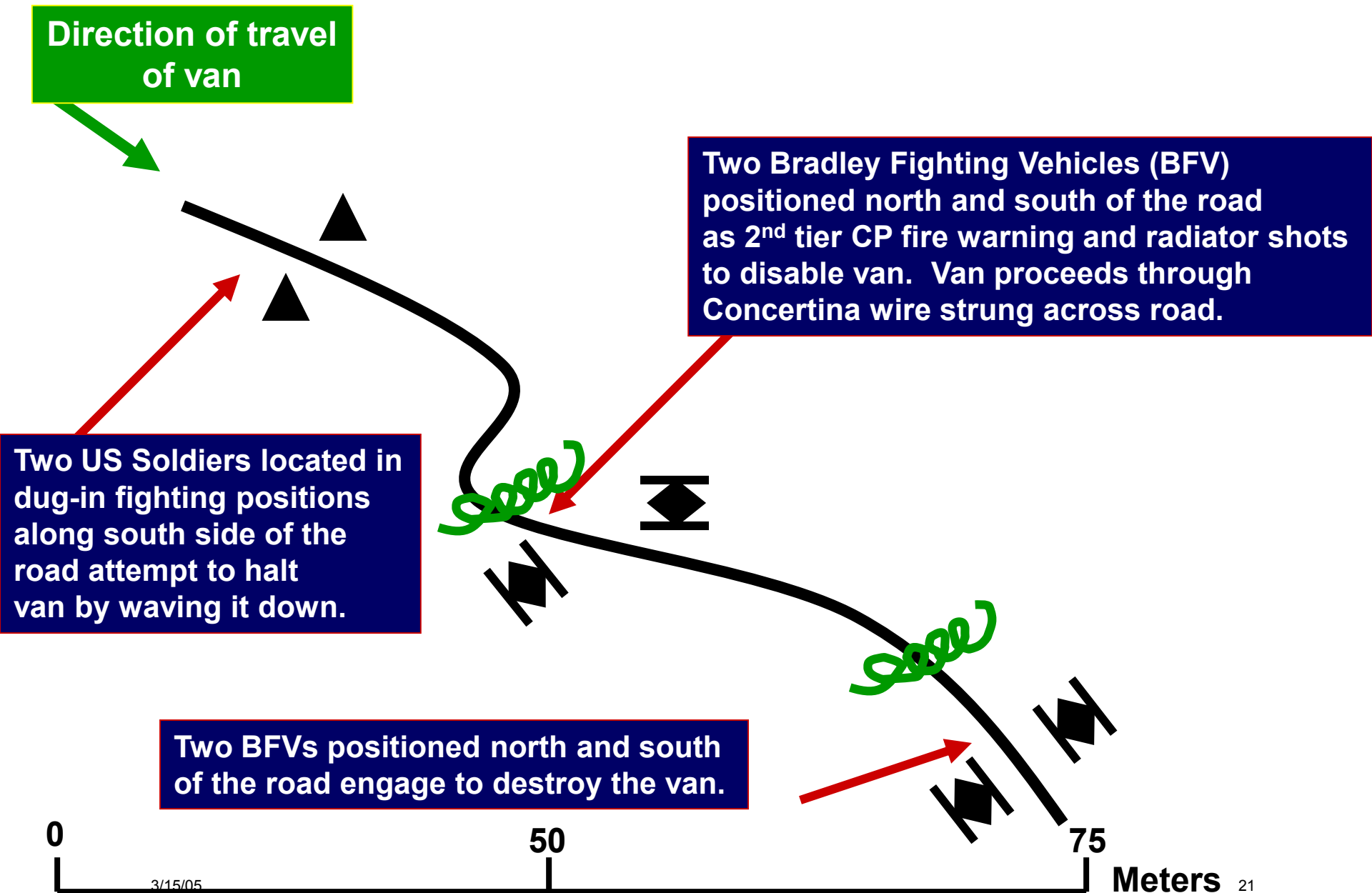
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Meters 21

3/15/05



NON-LETHAL WEAPONS

(Recommended Devices)

- To prevent vehicle from breaking through check points
 - Vehicle Lightweight Arresting Device (British version)
 - Caltrops / Road Spikes
 - Portable Barriers / Portable Vehicle Arresting Barrier
- Provides protection against suicide bombers
- Can be used to slow, block, or maze vehicles
 - Hasco / Jersey Barriers
- Long Range Acoustic Device:
 - Notify civilians of obstacles and to halt vehicle

OPERATIONAL AND STRATEGIC LEVEL IMPACT:

- WINS HEARTS AND MINDS OF THE IRAQI PEOPLE
- PREVENT WORLD OUTCRY / MEDIA ATTENTION

Vehicle Lightweight Arresting Device

■ Description

- Road spikes in mesh blanket
- Entangles wheels/axles

■ Advantages

- Small / light weight
- Portable / rapidly deployable
- Reusable / low cost
- *Easier to handle than caltrops*

■ Disadvantages

- Loss of control of vehicle (swerving to avoid blanket)
- *Time to detangle -- Unavailable for immediate follow-up attack*



Caltrops

■ Description

- 4-prong iron spike (deflates tires)
- Always lands in upright position when scatte
- Hollow--can puncture self-sealing tires

■ Advantages

- Small / Light weight
- Rapidly Deployable
- Reusable / Low Cost

■ Disadvantages

- *Laceration risk (to handler)*
- Time / distance to stop vehicle
- Loss of control of vehicle (particularly if only one tire is blown)
 - » Vehicle may crash into some other barrier, injure pedestrians/occupants
- *Need a large quantity to cover wide area*



“Scatterjacks”



Road Spikes

■ Description

- Flexible or rigid rows of spikes (deflates tires)
- Can also place under a vehicle being searched

■ Advantages

- Small / light weight
- Portable / rapidly deployable
- Reusable / low cost
- *Easier to handle than caltrops*



LazyTongs

■ Disadvantages

- Stability during successive attacks
- Time / distance to stop vehicle
- Loss of control of vehicle (swerving to avoid spill)
 - » Vehicle may crash into another barrier, injure pedestrians/occupants



MagnumSpike



Portable Barriers / Jersey Barriers

- **Description**
 - Manual / automatic pop-up road blocks
- **Advantages**
 - Stopping Power
 - Remote control activation
 - *Selective targeting*
- **Disadvantages**
 - Generally permanent
 - Expensive
 - Requires dedicated prime mover



RisingKerbs

- **Description**
 - Concrete/Plastic road blocks
 - Used to stop (or slow) vehicle
- **Advantages**
 - *Stopping power*
 - Can be filled with water, sand, or other materials
 - Reusable – relatively low cost
- **Disadvantages**
 - *Heavy - difficult to move*
 - Target indiscriminate



Portable Vehicle Arresting Barrier

- **Description**
 - Highly effective vehicle stopping “net”
- **Advantages**
 - Stopping Power
 - Allows normal traffic flow
 - *Selective targeting*
- **Disadvantages**
 - Time to set up
 - Not easily transported









































































High Intensity Directional Acoustics

- **Modes of operation:**
 - **Broadcast sound files for warnings**
 - **High pitched, 150 decibel, narrow-beam tone for crowd control**
- **Easily transportable and employable**
- **Requires energy source (generator)**
- **Long Range Acoustic Device (LRAD)**
 - » **Limited fielding in Iraq**



Technologies Assessment

	Effect on Target *	Selective Targeting	Portability	Range	Cleanup	Maturity	Synergy	Cost	Robustness	Legal
Caltrops										
Road Spikes										
Jersey Barriers										
Portable Barriers										
Portable Vehicle Arresting Barrier										
Vehicle Lightweight Arresting Device										
High Intensity Directional Acoustics										

•When target confined to limited area ** All need to be backed up with lethal force

 = Favorable

 = Unknown

 = Problematic

WHAT COULD HAVE HAPPENED

Direction of travel
of van

- Vehicle Arresting Device
- Portable barrier
- CALTROPs
- Road Spikes
- To stop vehicle

Two Bradley Fighting Vehicles (BFV)
positioned north and south sides of the
road as 2nd tier.

- Long Range Acoustic Device
 - to notify van to halt
- Hasco Barriers
- Jersey Barriers
 - to slow vehicles

- Hasco Barriers
- Jersey Barriers
 - to slow vehicles
- Vehicle Arresting Device
- CALTROPs
 - To stop vehicles

Two BFVs Positioned north and south sides
of the road as 3rd tier.

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Meters 30

3/15/05

PLANNING CONSIDERATIONS

- **Intel:**
 - **When fighting in vicinity of non combatant civilians, non lethal weapons should be considered**
 - **Civilian actions must be war-gamed as part of the overall ground plan**
 - **HWY 9 was the only major highway in vicinity of AN Najaf.**
- **Logistics:**
 - **Consider impact on load plan and availability of transportation**
 - **Must have a plan to transport desired non-lethal weapons in theater**
 - **limited transportation assets at battalion level**
- **Legal:**
 - **ROE**
- **Public Acceptance:**
 - **Must be ready to explain your actions to civilians**
 - **Maintain public support by reducing civilian casualties**

Summary

- **The non-lethal course has been very well received by the students.**
- **The course has been a means to expose the future leaders of DoD on the advantages and limitations of non-lethal technologies.**
- **The student scenarios have provided a forum between today's federal and state agencies to discuss non-lethal technologies within an academic environment.**



Non-Lethal Acceptability Challenges: Standards, Human Effects, Testing, and Training Forum

Lieutenant Colonel Mark Wrobel, USAF, JNLWD

Dr. Mary Williams, JNLWD

Lieutenant Colonel Jonathan Drummond, USAF, AFRL

Dr. John Kenny, Penn State University

Mr. Larry Bickford, US Army Aberdeen Proving Ground

Moderator: Ms. Susan Levine, JNLWD

Non-Lethal Defense VI Hyatt Regency, Reston

14-16 March 2005





Non-Lethal Academic Initiatives Forum – Panel Discussion

Mr. David Koplow, Georgetown University Law School
Lieutenant Colonel Ed Hughes, USA (Ret), Penn State University
Dr. Glenn Shwaery, University of New Hampshire

**Non-Lethal Defense VI Hyatt Regency, Reston
14-16 March 2005**





The View From Overseas Forum Various Topics – Panel Discussion

Dr. Martin Hubbard, United Kingdom

Mr. Pascal Paulissen, Netherlands

Dr. Marten Risling, Sweden

Mr. Frederico Aguiar, Brazil

**Non-Lethal Defense VI Hyatt Regency, Reston
14-16 March 2005**



Swedish background

- Located at Baltic Sea
- Long history of war against Russia
- Charles XII tried to invade Russia (1709)
- Small population – many emigrated to USA
- Soviet invasion was the main threat during Cold War

Swedish armed forces today

- Invasion not considered a realistic threat
- Decreased budget
- Budget tied up by large investments
→ non-proportional reduction in military personnel
- International missions more and more important

Swedish international UN missions

- Several during cold war: Korea, Gaza, Congo, Lebanon, Cyprus
- During recent years: Bosnia, Kosovo, Dessert storm, Afghanistan, Congo
- A need for NLW has been recognized

Users of NLW in Sweden

- Police
 - Tasers , since 2004
 - Impact weapons - special teams
 - OC, some departments
- Military
 - No systems in use

NLW research at FOI – Swedish Defence Research Agency

■ High Power Microwaves

- Systems
- Protection
- Bioeffects

■ Impact weapons

- Systems
- Bioeffects of blunt trauma

Nervous System

No acute change in structure

No change in blood-brain barrier function

Long term effects unknown

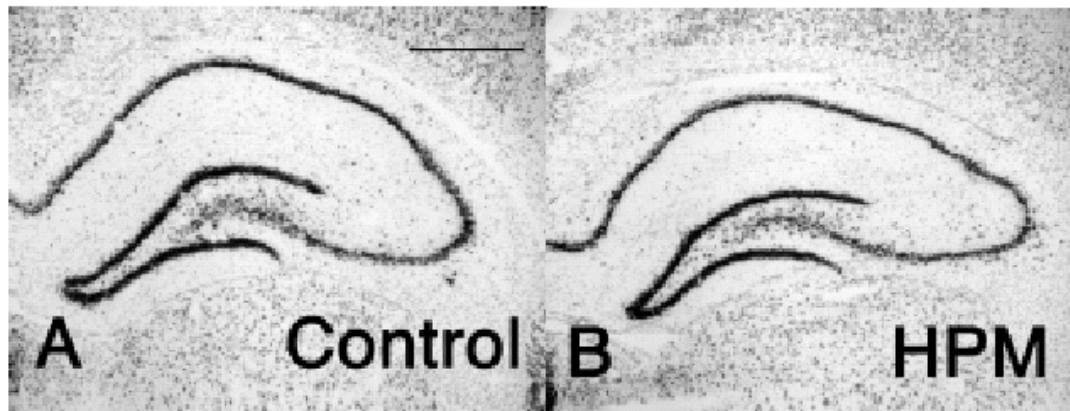
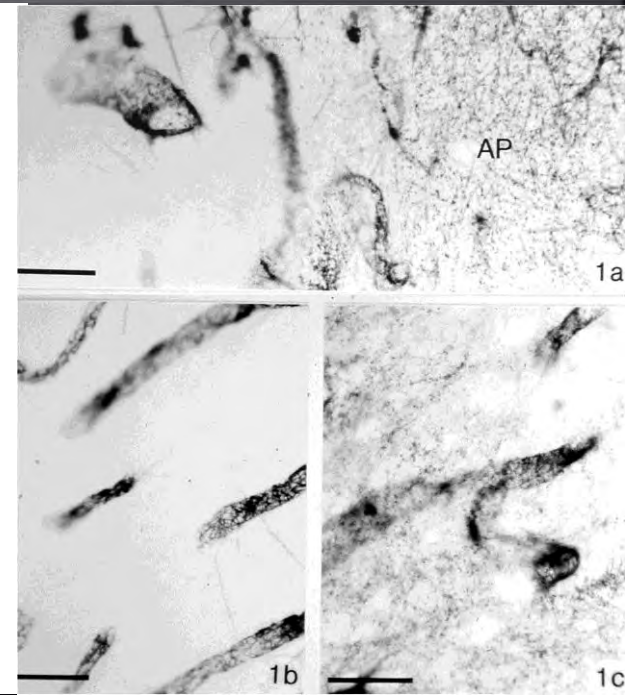


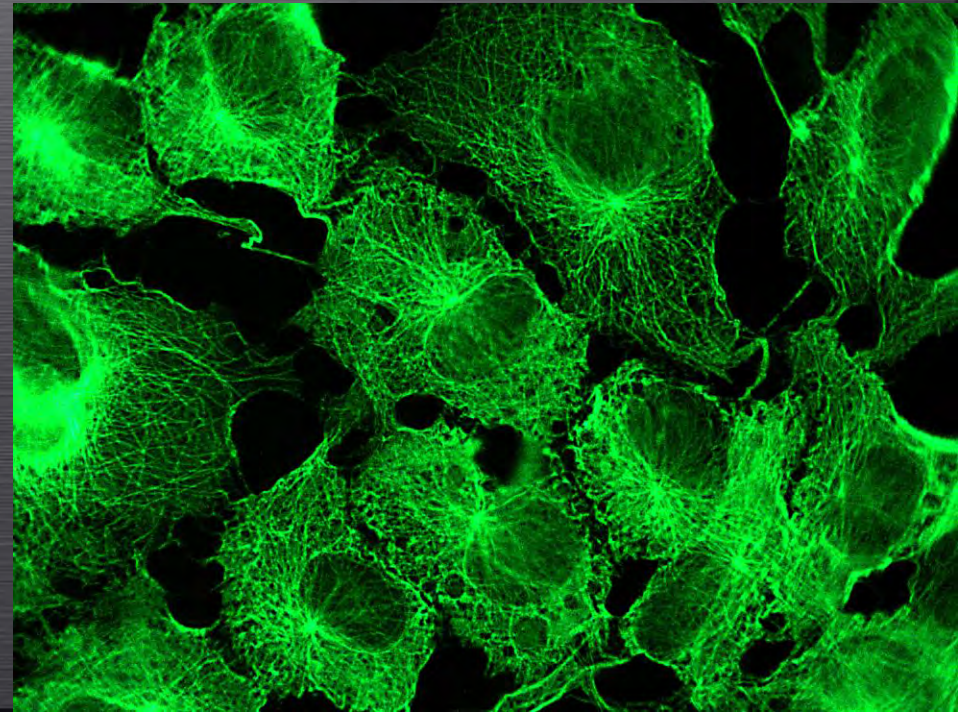
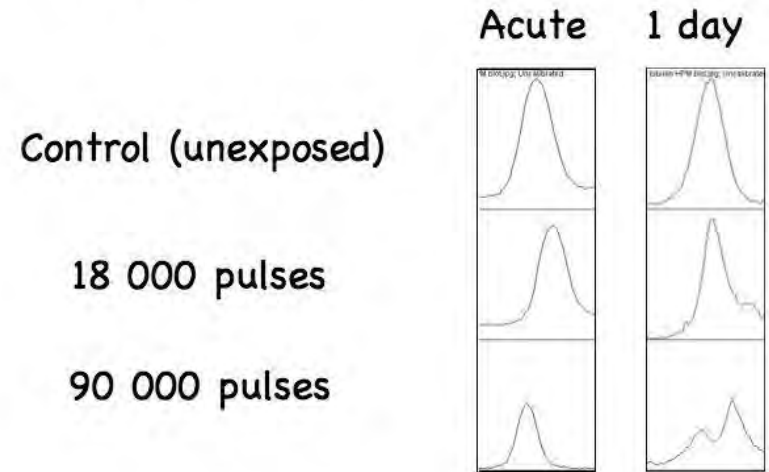
Fig. 2. Micrographs showing sections through the hippocampus of a sham exposed (A) and a rat exposed to HPM for 60s. The sections were hybridized with an oligonucleotide probe complementary to alk 5 (transforming growth factor receptor I). Note that the intensity of the labeling and the configuration of the hippocampus is virtually the same in the two sections. The scale bar represents 0.5 mm.



Tubulin

- Filaments – cytoskeleton
- Of importance for cell structure and division
- Dynamic turnover

Degradation of tubulin in glioma cells



VEGF

Vascular Endothelial Growth Factor

Regulates growth and survival of vascular cells and many nerve cells

Induction of VEGF protein



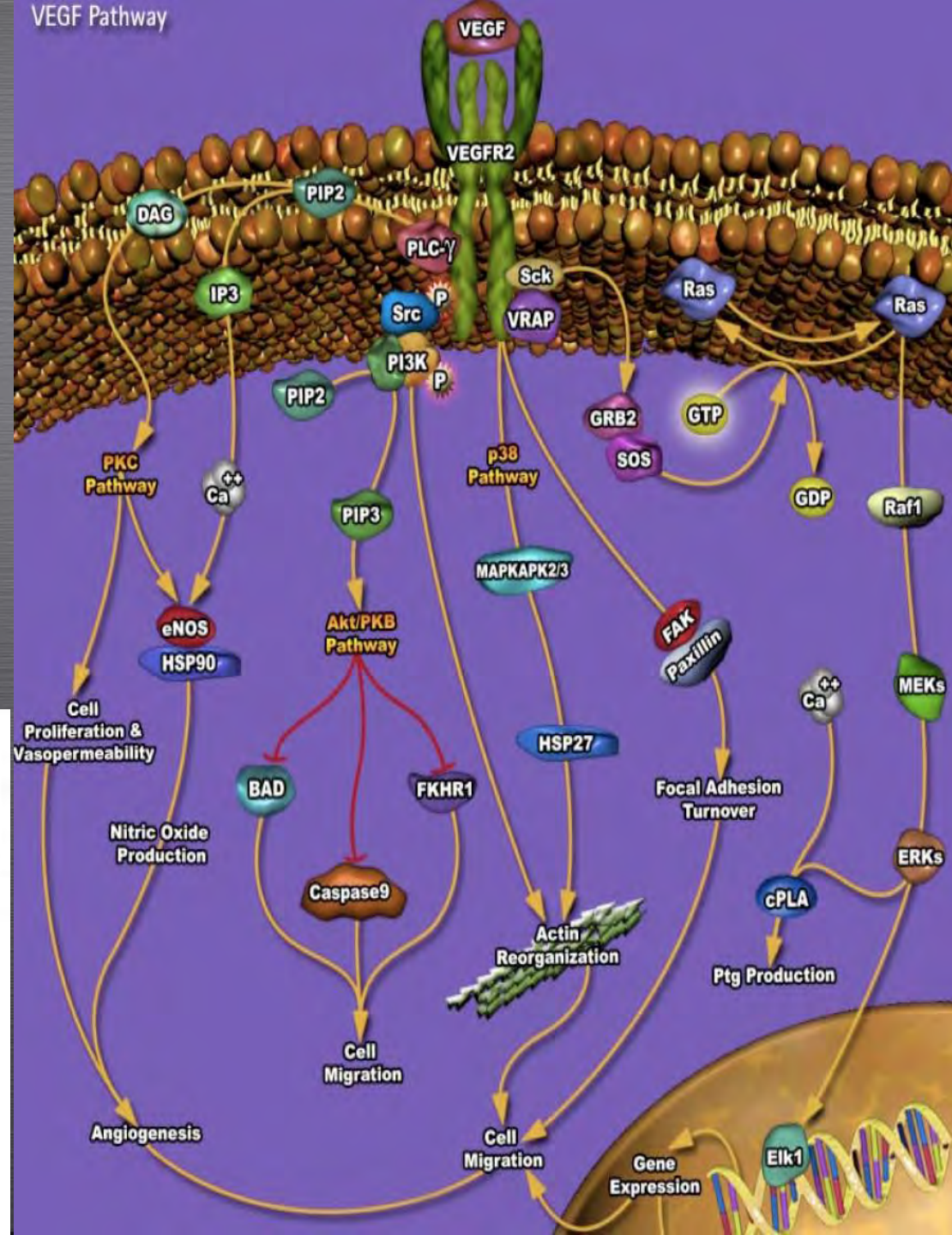
C6 Glioma cells

Exposed for 18000 pulses of HPM at 22 kV/m

Control

Acute

1 day



The number of pulses
that are needed
for effects on tubulin
and VEGF are much
higher than
realistic use of HPM

Examples of collaboration

- European Working Group – NLW
- Cepa (microwaves)
- NATO (HFM 073)



2nd Virtual Working Group

- **Mårten Risling**, Experimental traumatology, FOI, Sweden
- **Valeri Khrupkin**, State Institute for postgraduate training and advanced experience of military doctors, Moscow, Russia
- **Stanislaw Szmigielski**, Department of Microwave Safety, Military Institute of Hygiene and Epidemiology Warsaw, Poland
- **Dominique Loye**, Mines-Arms Unit, Legal Division, International Committee of the Red Cross
- **Donald A. Lund**, Justiceworks Institute for Policy and Social Science Research, University of New Hampshire, Durham, USA
- **Amy Truesdell**, Homeland Security Support Programs National Security Research, USA
- **Michael Murphy**, AFRL/HEDR Brooks city base, USA
- **Theresa Ridgeway** 2914 Calle Heraldo, San Clemente, Ca USA 92673
- **Ulf Arborelius**, Experimental traumatology, FOI, Sweden
- **Igor Linkov**, Cambridge Environmental Inc. USA
- **Ingrid Philippons**, CNS pharmacology Research Group Medical Countermeasures, TNO Defense, Security and Safety, The Netherlands
- **Ian Richard Grose**, Injury Modelling Team, Dstl Porton Down, UK
- **Eduard David**, Witten/Herdecke University, Germany



Non-lethal Technology Innovation Center (NTIC) University of New Hampshire Durham, NH

Sponsored by a grant from the Joint
Non-lethal Weapons Directorate

www.unh.edu/ntic



JNLWD and NTIC Missions

Air Force

Army

Marines

Navy

Coast Guard

SOCOM

Justice

To advance the non-lethal capabilities in peacekeeping, conventional warfare, national security, policing, disaster relief, humanitarian assistance, and noncombatant evacuation operations, NTIC has a mission to provide the U.S. military and law enforcement agencies with access to the nation's best research professionals.

Academia

Industry

**Government
Laboratories**



NTIC Mission Statement

To effect the next generation of non-lethal capabilities by identifying and promoting the development of innovative concepts, materials, and technologies.

We serve as an academic outreach program for non-lethal S&T research.

Activities

- Innovative Research and Survey Grants
- Non-lethal Technology and Academic Research (NTAR) Symposium
- Technical Working Groups

Innovative Research Project Grants

Interdisciplinary 1-2 year projects that emphasize innovative NLW applications involving new materials/methods or novel uses of existing materials and technologies.

Exploration Survey or Review Grants

Non-renewable grants often serve as feasibility studies or reviews of existing technologies. Certain sociological or behavioral studies are considered.

Recently funded projects

- Electromagnetic properties of LIP
- Shockwave Characterization and Enhancement with Femtosecond Laser Irradiation
- Neuromuscular Disruption with Ultrashort Pulses
- Electromagnetic and thermal effect of directed energies on biological material
- Behavioral and medical outcomes of NLW
- Assessing the universality of crowd conflict parameters

IRP Grant Program

There is a strong commitment to support the research programs of U.S. academic institutions. Student participation is highly encouraged. The center strives not only to promote and facilitate the development of the next generation of NLW and capabilities, but to develop the next generation of NLW researchers. Industry is encouraged to partner with academia if applying to the grant program.

Driving Issues for Academia

- Multiple Levels of Intellectual Effort
PI, (Post)Graduate, Undergraduate Students
- Job Training/Practical Application for Students
- Publish or Perish, especially for non-tenured faculty
- Presentation at symposia/conferences
- Intellectual Property Issues

Driving Issues for Academia (cont).

- Political/public acceptance - University letter of support
- Agency support regarding press inquiries; “I don’t have anything interesting to convey.”

Search Services

- Keyword searches facilitate locating worldwide expertise and grant funding opportunities.
- Varied subscription requirements based on user – Corporation, University, Individual.
- Search by Areas of Expertise, Member Institution, Geography, Researcher Name.
- Ease of use – Keywords arranged by discipline (Agriculture, Arts, Education, Engineering, Law, etc)

Search Services (cont.)

- InfoEd International, Inc (www.infoed.org)
 - SPINPlus, funding opportunities and CV database service – contains SPIN, GENIUS, SMARTS – automated alert system matches investigators with grant and contract announcements based on User Profiles. Univ > industry > government. No indiv.
- Grants.gov (www.grants.gov) comprehensive database to search and apply for competitive grant opportunities from ALL Federal agencies.

Search Services (cont.)

- Community of Science (www.cos.com)
 - Find funding with [COS Funding Opportunities](#)
 - Identify experts and collaborators with [COS Expertise](#)
 - Promote your research with a [COS Profile](#)
- The Foundation Center (www.Fdncenter.org)
 - Individual subscription based search database for philanthropy – scholarships, grants, awards.

Search Services (cont.)

- Society of Research Administrators: SRA International
www.srainternational.org/newweb/grantsweb/index.cfm
Site for Office of Research admin with reference information for education, US and International government. (i.e. FAR, ejournals, grant forms, etc)

The U.S. Department of Defense Joint Non-Lethal Weapons Program



**NDIA – Non-Lethal Acceptability Challenges: Standards,
Human Effects, Testing and Training Forum
15 March 2005**

Lt Col Mark C Wrobel
Health Effects Officer
(703) 784-5715 x230
Wrobelmc@jnlwd.usmc.mil



NL Capabilities Human Effects Challenges

Objective: Provide quality effects data to support Warfighter confidence in NL technologies

- Limited Data/Experience
- Limited Resources
- No standards
- New Parameter Space
 - Requirements across broad realm of technologies
 - Assessment of both effects and effectiveness
 - Quantifying target behavior response
 - Accounting for variations in populations
 - Addressing sensitive populations vs intended targets



Human Effects and NLWs

**Weapon
Parameters**

Human Effects



Stimuli to Human Body:

- Light/Sound
- RCA
- BOP
- Kinetic
- Electrical
- Laser / HPM

Human Response



“Physical” Probabilities:

- Intended effect
- Non-Permanent injury
- Permanent injury
- Kill

“Psychological” Probabilities:

- Individual Response
- Crowd Response

*Both the “effect” and “effectiveness”
must be clearly understood...*



JNLWP Human Effects Process

- Risk characterizations
- Tools for stimuli-response
- Manage human effects database and research

HECOE

A team of DoD experts providing a “**one stop shop**” for NLW human effects information

Human Effects Target
Response Effectiveness and
Risks

HERB

A Joint Service board of medical officers providing independent review of human effects

Objective
identification of
risks

**NLW
PMs**

Milestone
Decision
Package

MDA

Independent
reviews

HEAP

A non-governmental, blue-ribbon panel providing independent assessments

Milestone
Decisions

**Fielded
Capabilities**

Human Effects Risk Characterization Framework



Effects Based NLW Development

Family of NLW Human Effects Models

Operational
requirement

- Deter
- Distract
- Dissuade
- Disorient
- Distress
- Render Incapable
- Incapacitate

Physiological,
Psychological,
Behavioral
Correlate
(Desired Human
Effects)

ATBM

DE

RCA

EMI

MSD

Crowd

Types and
levels of Non-
Lethal
Stimuli that
achieve
desired
effects, safely



Biomedical Research Compliance

- Animal Use compliance with/ Title 7 U.S.C Section 21131, Title 9 CFR Parts 1-4, DoD Directive 3216.1, and implementing service regulations
 - American Association for the Accreditation of Laboratory Animal Care
 - Institutional Animal Care and Use Committees
 - NIH Pub 86-23, Guide for Care and Use of Lab Animals
 - Annual reporting requirements to OSD
- Human Research compliance w/ Title 10 U.S.C. Section 980, Title 32 CFR Part 219, DoD Directive 3216.2, and implementing service regulations
 - Stipulates compliance with DHHS Reg “Protection of Human Subjects”, Title 45 CFR Part 46
 - Requirements for Institutional Review Board, Assurance of Compliance
 - Requirement for informed consent
 - Requirement to protect rights and welfare of subjects
 - Occupational standards often used as benchmarks (ANSI, OSHA)



Wrap-up

- Understanding the human effects of Non-Lethal Technologies is fundamental to their development
- Research to characterize effects and effectiveness is challenging and only starting in many areas
- The JNLWP has developed processes to facilitate understanding these effects
- Efforts continue to address policy issues associated with NL standards and training with NLs
- Working to formalize processes in DoD requirements generation and acquisition frameworks